Penguin Series
Little/Crest/Emperor
(Machine Code: A246/A247/A248)

Service Manual

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POINT TO POINT DIAGRAM & ELCTRICAL
A246/A247/A248/A822 POINT TO POINT DIAGRAM
ELECTRICAL COMPONENT LAYOUT (A246/ A247/ A248
ELECTRICAL COMPONENT LAYOUT (A246/ A247/ A248
SORTER STAPLER (A821)
ELECTRICAL COMPONENT LAYOUT (A821)

⚠ IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

1. Before disassembling or assembling parts of the copier and peripherals, make sure that the copier power cord is unplugged.
2. The wall outlet should be near the copier and easily accessible.
3. Note that some components of the copier and the paper tray unit are supplied with electrical voltage even if the main switch is turned off.
4. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrified or mechanically driven components.
5. The inside and the metal parts of the fusing unit become extremely hot while the copier is operating. Be careful to avoid touching those components with your bare hands.
6. The copier is not attached to the table. Pushing the copier too heard may cause it to drop onto the floor. While moving the copier, push the table.
7. When the main switch is tuned on, the machine will suddenly start turning to perform the developer initialization. Keep hand away from any mechanical and electrical components during this period.

HEALTH SAFETY CONDITIONS

1. Never operate the copier without the ozone filters installed.
2. Always replace the ozone filters with the specified ones at the specified intervals.
3. Toner and developer are non-toxic, but if you get either of them in your eyes by accident, it may cause temporary eye discomfort. Try to remove with eye drops or flush with water as first aid. If unsuccessful, get medical attention.

OBSERVANCE OF ELECTRICAL SAFETY STANDARDS

1. The copier and its peripherals must be installed and maintained by a customer service representative who has completed the training course on those models.

CAUTION: The RAM board on the main control board has a lithium battery which can explode if replaced incorrectly. Replace the RAM board only with an identical one. The manufacturer recommends replacing the entire RAM board. Do not recharge or burn this battery. Used RAM board must be handled in accordance with local regulations.

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Do not incinerate the toner cartridge or the used toner. Toner dust may ignite suddenly when exposed to open flame.
2. Dispose of used toner, developer, and organic photoconductor according to local regulations. (These are non-toxic supplies.)
3. Dispose of replaced parts in accordance with local regulations.
4. When keeping used RAM boards in order to dispose of them later, do not put more than 100 RAM boards per sealed box. Storing larger numbers or not sealing them apart may lead to chemical reactions and heat build-up.

1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATION

Configuration:	Console
Copy Process:	Dry electrostatic transfer system
Toner Supply Control:	Fuzzy Control
Photoconductor:	OPC drum
Originals:	Sheet/Book
Original Size:	Maximum A3/11" x 17"
Original Alignment:	Left rear corner
Copy Paper Size:	Maximum A3/11" x 17" (Tray & By-pass) A4/8 1/2" x 11" (Tandem LCT) Minimum A5/5 1/2" x 8 1/2" (Tray) A4/8 1/2" x 11" (Tandem LCT) A6/5 1/2" x 8 1/2" (By-pass)
Duplex Copying:	Maximum A3/11" x 17" Minimum A5/5 1/2" x 8 1/2" (Sideways)
Copy Paper Weight:	Paper tray: 52 ~ 128 g/m^2, 14 ~ 34 lb By-pass feed table: 52 ~ 200 g/m^2, 14 ~ 53 lb Duplex copying: 64 ~ 104 g/m^2, 17 ~ 24 lb
Reproduction Ratios:	4 Enlargement and 5 Reduction + Create Margin (93%)

	A4/A3 Version	LT/LDG Version
Enlargement	200% 141% 122% 115%	200% 155% 129% 121%
Full Size	100%	100%
Reduction	82% 75% 71% 65% 50%	85% 77% 74% 65% 50%

Power Source: 115 V, 60 Hz, more than 20 A (for N.A)
220 ~ 240 V, 50 Hz/60 Hz, more than 10 A (for Europe and Asia)

Power Consumption:

- A246 copier -

	Copier only	**Full system*[1]**
Warm up	1.20 kVA	1.22 kVA
Stand-by*[2]	0.22 kVA	0.24 kVA
Low Power mode*[2]	0.185 kVA	0.205 kVA
Copying	1.40 kVA	1.40 kVA
Maximum	1.70 kVA	1.75 kVA
Off-mode	0.001 kVA	0.001 kVA

- A247 copier -

	Copier only	**Full system*[1]**
Warm up	1.20 kVA	1.22 kVA
Stand-by*[2]	0.22 kVA	0.24 kVA
Low Power mode*[2]	0.21 kVA	0.23 kVA
Copying	1.50 kVA	1.50 kVA
Maximum	1.70 kVA	1.75 kVA
Off-mode	0.001 kVA	0.001 kVA

- A248 copier -

	Copier only	**Full system*[1]**
Warm up	1.20 kVA	1.22 kVA
Stand-by*[2]	0.22 kVA	0.24 kVA
Low Power mode*[2]	0.21 kVA	0.23 kVA
Copying	1.60 kVA	1.60 kVA
Maximum	1.70 kVA	1.75 kVA
Off-mode	0.001 kVA	0.001 kVA

*[1]Full System:

- Mainframe with dual job feeder, sorter stapler and 3,500-sheet large capacity tray

*[2]: When the anti-condensation heaters are off.

Noise Emission: Sound Pressure Level:
The measurements are made according to ISO7779

- A246 copier -

Sound pressure level (The measurements are made according to ISO 7779 at the operator position.)

	Copier only
Stand-by	Less than 34 dB (A)
Copying	Less than 57 dB (A) (average)

Sound power level (The measurements are made according to ISO 7779.)

	Copier only
Stand-by	Less than 48 dB (A)
Copying	Less than 71 dB (A) (average)

- A247 copier -

Sound pressure level (The measurements are made according to ISO 7779 at the operator position.)

	Copier only
Stand-by	Less than 34 dB (A)
Copying	Less than 59 dB (A) (average)

Sound power level (The measurements are made according to ISO 7779.)

	Copier only
Stand-by	Less than 51 dB (A)
Copying	Less than 72 dB (A) (average)

- A248 copier -

Sound pressure level (The measurements are made according to ISO 7779 at the operator position.)

	Copier only
Stand-by	Less than 36 dB (A)
Copying	Less than 59 dB (A) (average)

Sound power level (The measurements are made according to ISO 7779.)

	Copier only
Stand-by	Less than 54 dB (A)
Copying	Less than 73 dB (A) (average)

Dimensions:

	Width	Depth	Height
Copier only	690 mm 27.2"	698 mm 27.6"	980 mm 38.6"
Copier with dual job feeder, sorter stapler, and 3,500-sheet large capacity tray	1,659 mm 65.4"	698 mm 27.6"	1,113 mm 43.9"
Copier with dual job feeder, sorter stapler with punch, and 3,500-sheet large capacity tray	1,659 mm 65.4"	698 mm 27.6"	1,113 mm 43.9"

Weight: Copier only: (Without the optional platen cover = Approximately 2 kg)

Approximately 175 kg

Zoom: From 50% to 200% in 1% steps

Copying Speed:

	A4/LT (sideways)	A3/DLT	B4/LG
A246 copier	51 (A4 others) 50 (A4/in France) 50 (LT)	26	32
A247 copier	60	31	38
A248 copier	70	36	44

Warm-up Time: Less than 5 minutes (A246 copier, 20°C)
Less than 5.5 minutes (A247/A248 copier, 20°C)

First Copy Time: (A4/5 1/2" x 11" sideways from the 1st feed station): 3.1 seconds (A246 copier)
2.6 seconds (A247/A248 copiers)

Copy Number Input: Number keys, 1 to 999 (count up or count down)

Manual Image Density Selection: 9 steps

Automatic Reset: 1 minute standard setting; can also be set from 1 second to 999 seconds or no auto reset.

Copy Paper Capacity:

- By-pass feed table: approximately 50 sheets
- Paper tray: approximately 550 sheets
- Tandem LCT tray: approximately 1,550 sheets

Toner Replacement: 1,160 g/cartridge

Optional Equipment:

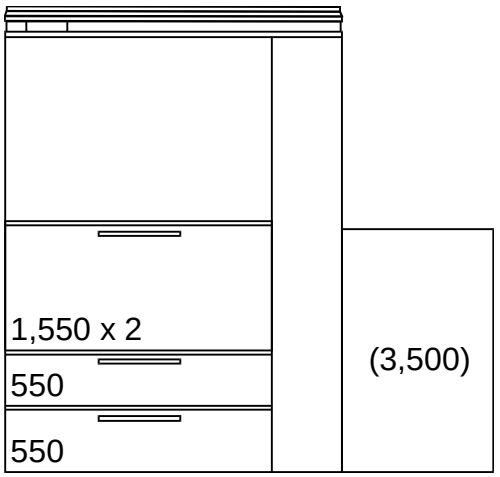
- Platen cover (A528-04)
- Dual job feeder (A610)
- 20 bin sorter stapler (Floor type) (A821-17: Ricoh, -22: NRG, -15: Savin/Ges U.S.A. –26: Infotec)
- 3,500-sheet Large capacity tray (A822)
- Receiving tray (A446-05)
- Key Counter Bracket D (A509-03)
- 20 bin sorter Stapler (Floor type) with punch (A821-57 (3 holes), -67 (2 holes): Ricoh, -62: NRG, -66: Infotec, -55: Savin/Ges U.S.A.)
- Guidance ROM KIT Type U (A870)
- Editing sheet (spare part)
- Original Tray type F (A430-07)
- Sorter Adapter type L (A902-19)
- 20 bin sorter stapler (Hunging type) (A658) (A246 copier only)

When the 20 bin sorter stapler (A658) is installed onto A246 copier, sorter adapter type L is required.

1.2 MACHINE CONFIGURATION

1.2.1 COPIER OVERVIEW

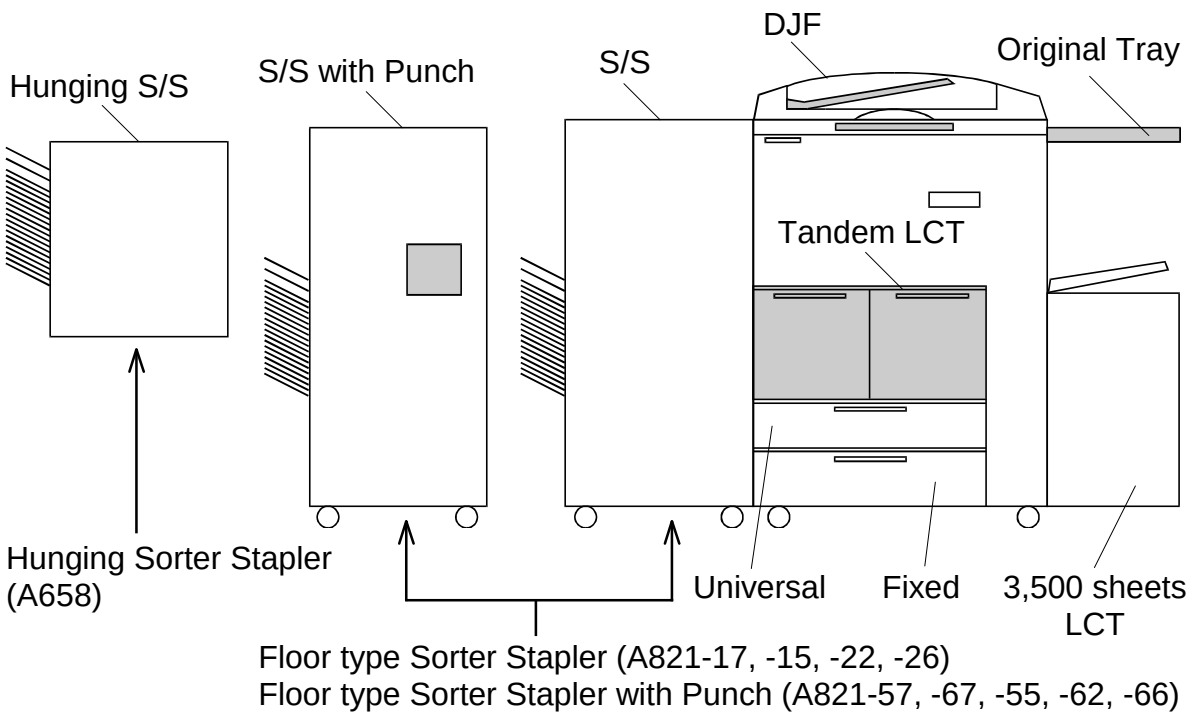
- A246/A247/A248 copiers -



A246V500.WMF

- Tandem LCT
  (including two 1,550-sheet LCT
- Two 550-sheet paper trays
- Optional 3,500-sheet large capacity tray

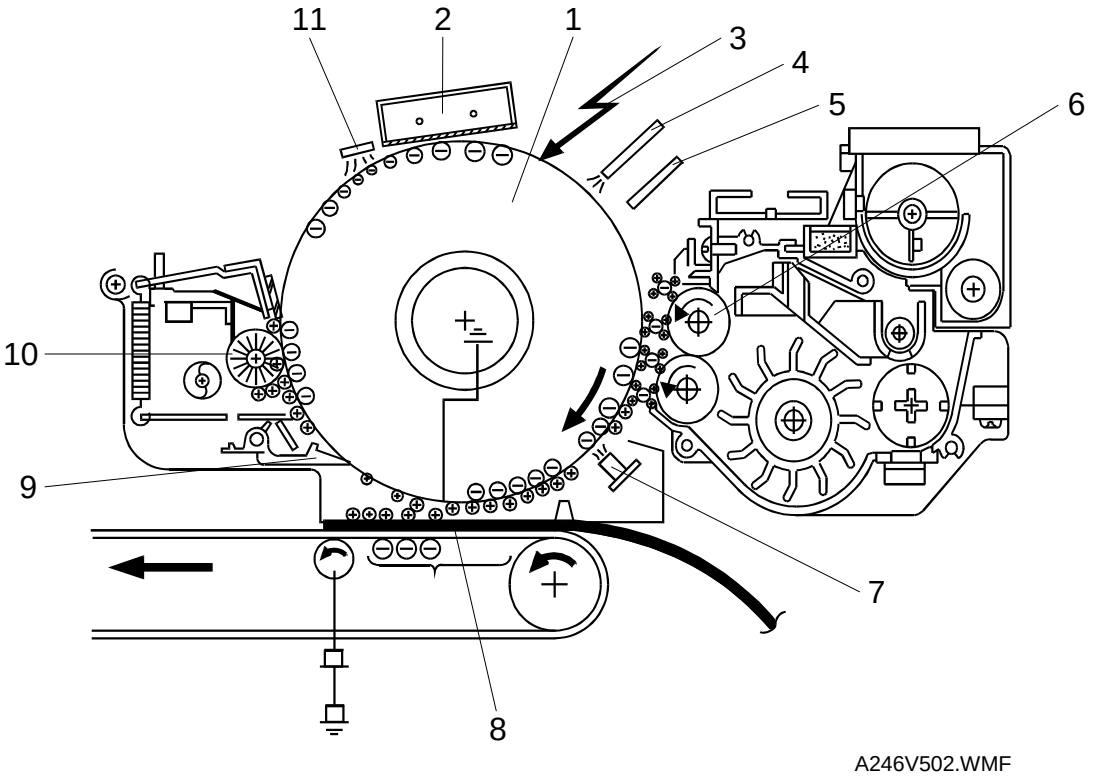
1.2.2 SYSTEM OVERVIEW



A246V501.WMF

MEMO

1.3 COPY PROCESS AROUND THE DURM



1. OPC DRUM
The organic photo conductive (OPC) drum (100 mm diameter) has high resistance in the dark and low resistance under light.

2. DRUM CHARGE
In the dark, the charge corona unit gives a uniform negative charge to the OPC drum. The charge remains on the surface of the drum. The amount of negative charge on the drum is proportional to the negative grid bias voltage applied to the grid plate on the charge corona unit.

3. EXPOSURE
An image of the original is reflected to the OPC drum surface via the optics section. The charge on the drum surface is dissipated in direct proportion to the intensity of the reflected light, thus producing an electrical latent image on the drum surface.

The amount of charge remaining as a latent image on the drum depends on the exposure lamp intensity controlled by the exposure lamp voltage.

4. ERASE
The erase lamp illuminates the areas of the charged drum surface that will not be used for the copy image. The resistance of drum in the illuminated areas drops and the charge on those areas dissipates.

5. DRUM POTENTIAL SENSOR
The drum potential sensor detects the electric potential on the drum to compensate image processing elements.

6. DEVELOPMENT
Positively charged toner is attracted to the negatively charged areas of the drum, thus developing the latent image. (The positive triboelectric charge of the toner is caused by friction between the carrier and toner particles.)

The development bias voltage applied to the development roller shaft controls two things:

1) The threshold level if toner is attracted to the drum or toner remains on the development roller.
2) The amount of toner to be attracted to the drum.

The higher the negative development bias voltage is, the less toner is attracted to the drum surface.

7. PRE-TRANSFER LAMP (PTL)
The PTL illuminates the drum to remove almost all the negative charge from the exposed areas of the drum. This makes image transfer easier.

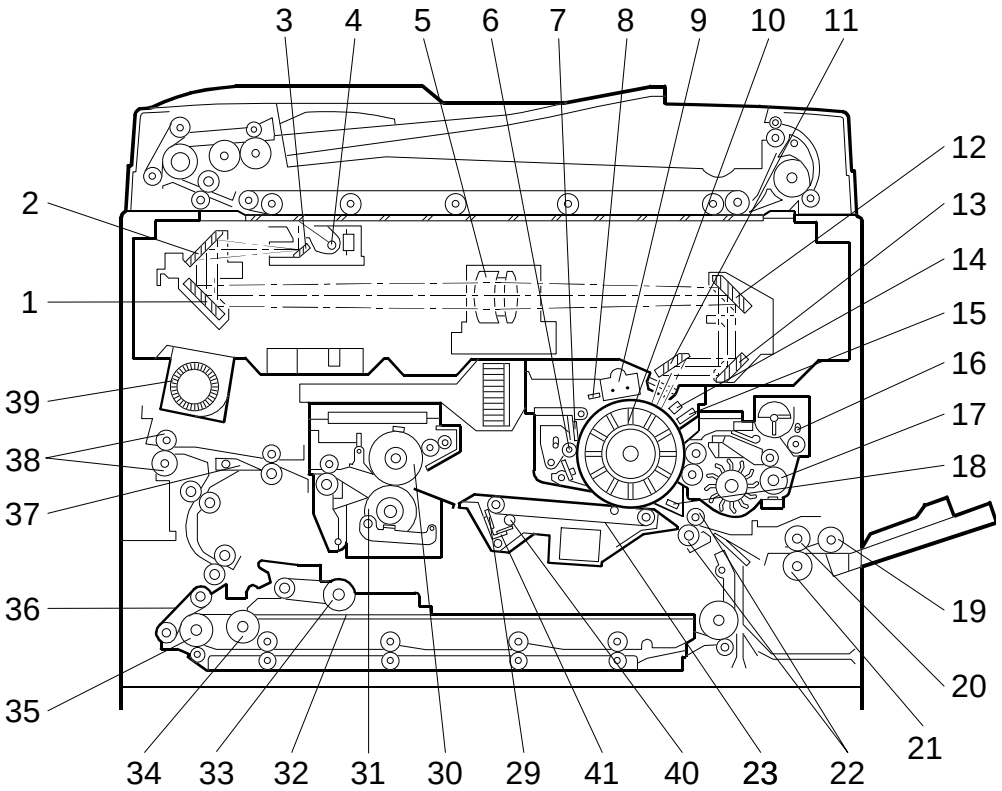
8. IMAGE TRANSFER
Paper is fed to the drum surface at the proper timing so as to align the copy paper and the developed image on the drum surface. Then, a negative charge is applied to the reverse side of the copy paper by the transfer belt, producing an electrical force which pulls the toner particles from the drum surface onto the copy paper. At the same time, the copy paper is electrically attracted to the transfer belt.

9. PAPER SEPARATION
Paper separates from the OPC drum by the electrical attraction between the paper and the transfer belt. The pick-off pawls help to separate the paper from the drum.

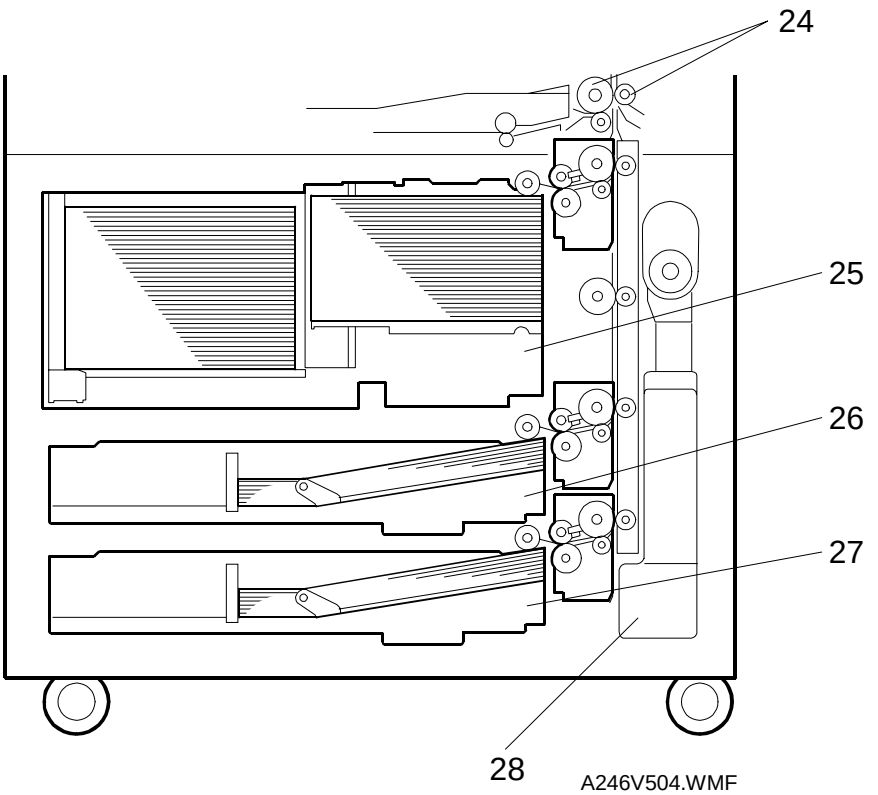
10. CLEANING
The cleaning brush removes toner remaining on the drum after image transfer and the cleaning blade scrapes off all the remaining toner.

11. QUENCHING
Light from the quenching lamp electrically neutralizes the charge potential of the drum surface.

1.4 MECHANICAL COMPONENT LAYOUT



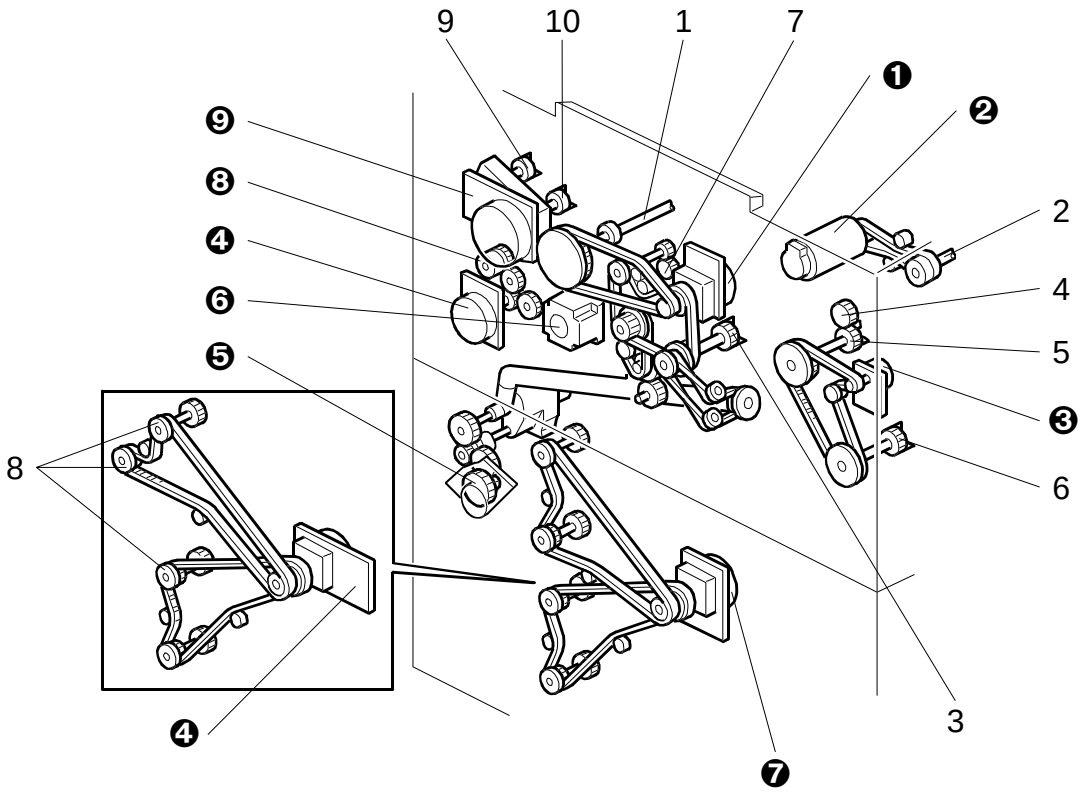
A246V503.WMF



A246V504.WMF

1. 3rd Mirror
2. 2nd Mirror
3. 1st Mirror
4. Exposure Lamp
5. Lens
6. Cleaning Brush
7. Cleaning Blade
8. Quenching Lamp
9. Charge Corona Unit
10. OPC Drum
11. 6th Mirror
12. 4th Mirror
13. 5th Mirror
14. Erase Unit
15. Drum Potential Sensor
16. Toner Hopper
17. Development Unit
18. Pre-Transfer Lamp
19. Pick-up Roller
20. Feed Roller
21. Separation Roller
22. Registration Rollers
23. Transfer Belt
24. Vertical Transport Rollers
25. Tandem LCT Tray
26. Universal Tray (550-sheet)
27. 550-sheet Tray
28. Toner Collection Bottle
29. Transfer Belt Cleaning Blade
30. Hot Roller
31. Pressure Roller
32. Jogger Fences
33. Duplex Positioning Roller
34. Duplex Pick-up Roller
35. Duplex Feed Roller
36. Separation Belt
37. Junction Gate
38. Exit Rollers
39. Optics Cooling Fan
40. Transfer Belt Cleaning Bias Roller
41. Transfer Belt Bias Roller Blade

1.5 DRIVE LAYOUT



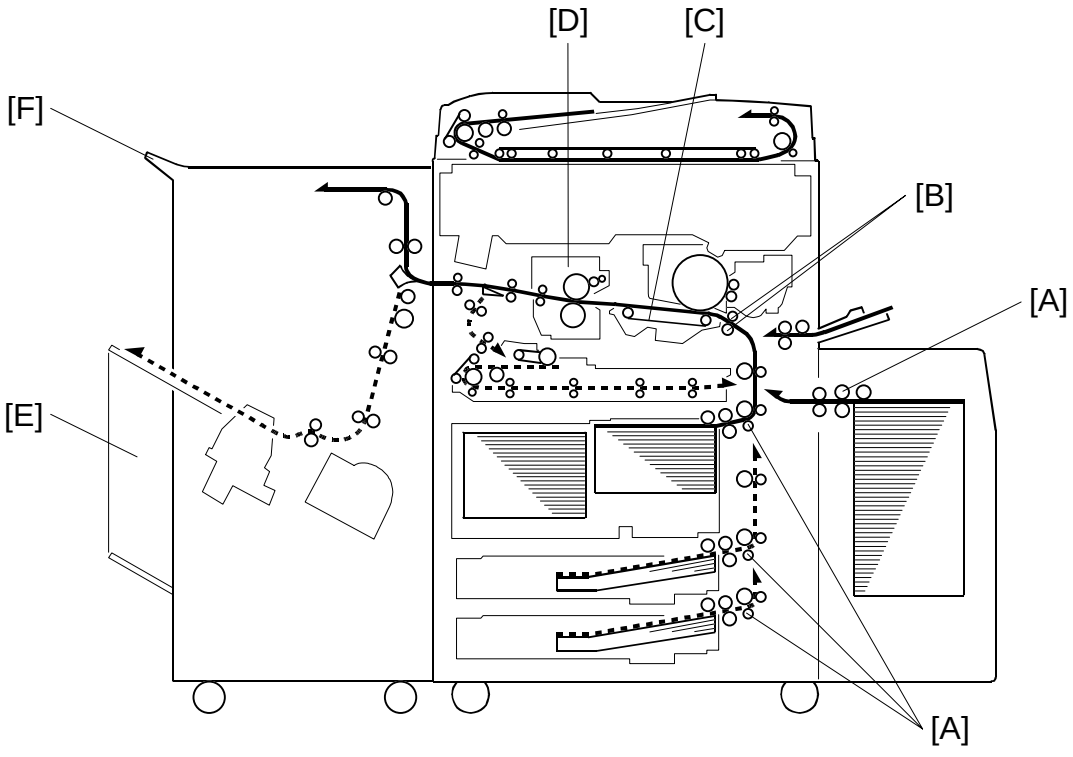
A246V505.WMF

❶ Main Motor
❷ Scanner Drive Motor
❸ Fusing/Duplex Drive Motor
❹ Paper Feed Motor
❺ Toner Collection Motor
❻ Registration Motor
❼ By-pass Feed Motor
❽ By-pass Feed Clutch
❾ Development Drive Motor

1. To OPC Drum
2. To Scanner Unit
3. To Transfer Belt Unit
4. To Paper Exit Unit
5. To Fusing Unit
6. To Duplex Unit
7. To Cleaning Unit
8. To Paper Feed Units
9. To Toner Hopper
10. To Development Unit

1.6 PAPER PATH

1.6.1 STANDARD COPYING

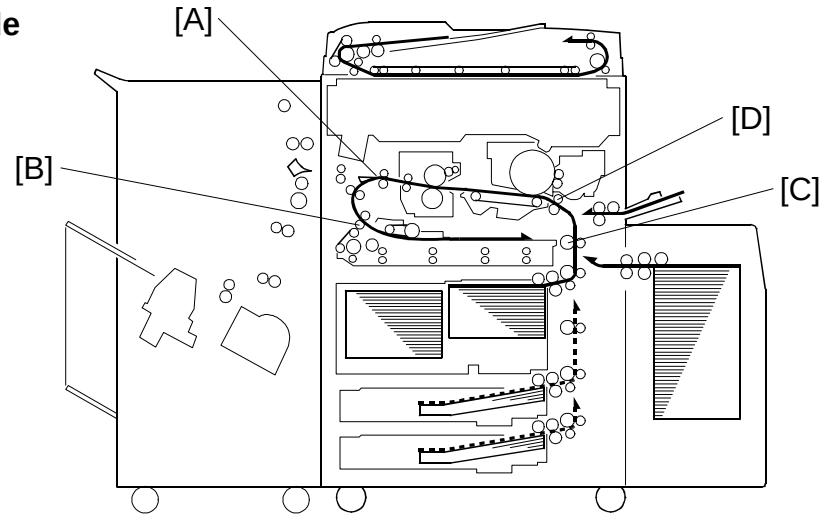


A246V506.WMF

Paper feed begins from the exterior LCT, by-pass feed table or paper feed stations in the paper tray unit. The copy paper then follows one of two paths inside the copier. The path followed depends on which mode the operator has selected. For copy processing, all sheets follow the same paths from the paper feed mechanism [A] through the registration rollers [B], transfer belt [C], and fusing unit [D]. After that, copies are delivered to the sorter bins [E] or proof tray [F], however, 2 sided copies are diverted for further processing.

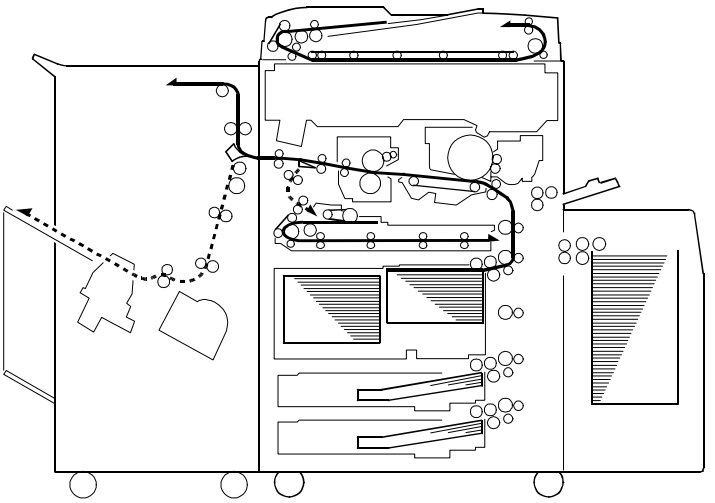
1.6.2 MULTIPLE 2-SIDE COPYING

a. Front Side



A246V507.WMF

b. Rear Side



A246V508.WMF

In this mode the junction gate [A] directs sheets exiting the fusing unit to the duplex tray entrance. After that, all sheets follow the path through the duplex entrance rollers [B].

After all front side copying is fed, the sheets on the duplex tray are fed in order from the bottom to the top and follow the path through the duplex feed mechanism and vertical transport rollers [C] to the registration rollers [D]. After that, these sheets follow the same path as standard copying from the registration rollers to the sorter.

1.7 ELECTRICAL COMPONENT DESCRIPTION

Refer to the electrical component layout on the reverse side of the point-to-point diagram for the location of the components using the symbols and index numbers.

Symbol	Name	Function	Index No.
Motors			
M1	Scanner	Drives the 1st and 2nd scanners.	5
M2	3rd Scanner	Drives the 3rd scanner.	11
M3	Lens Horizontal	Shifts the lens vertical position.	10
M4	Lens Vertical	Shifts the lens horizontal position.	19
M5	Main	Drives the main unit components.	120
M6	Development	Drives the development unit.	121
M7	Toner Bottle	Rotates the toner bottle to supply toner to toner hopper.	133
M8	Charge Wire Cleaner	Drives the charge wire cleaner to clean the charge wire.	30
M9	Fusing/Duplex	Drives the fusing unit, the duplex unit, and the exit rollers.	119
M10	Toner Collection	Transports the collected toner in the toner recycle unit for toner recycle.	126
M11	Toner Recycle	Drives the air pump to send recycled toner to the development unit.	129
M12	Paper Feed	Drives all feed and transport rollers in the paper tray unit.	94
M13	1st Lift	Raises the bottom plate in the 1st paper tray.	95
M14	2nd Lift	Raises the bottom plate in the 2nd paper tray.	97
M15	3rd Lift	Raises and lowers the bottom plate in the 3rd paper tray.	98
M16	By-pass Feed	Drives the by-pass feed rollers.	124
M17	Registration	Drives the registration rollers.	123
M18	Rear Fence	Moves the paper stack in the left tandem tray to the right tandem tray.	55
M19	Jogger	Drives the jogger fences to square the paper stack in the duplex unit.	43
M20	Optics Cooling Fan	Removes heat from the optics unit.	21
M21	Optics Board Cooling Fan	Removes heat from around the optics board.	118
M22	Drum Cooling Fan	Cools the drum unit to removes heat from around the duplex unit.	106
M23	Duplex Cooling Fan	Cools the paper on the duplex tray to reduce the heat around the drum.	114
M24	Exhaust Fan	Removes heat from around the fusing unit.	104

Symbol	Name	Function	Index No.
Magnetic Clutches			
MC1	Toner Supply	Turns the toner supply roller to supply toner to the development unit.	122
MC2	Toner Recycling	Drives the toner recycling unit.	125
MC3	1st Feed	Starts paper feed from tray 1.	75
MC4	2nd Feed	Starts paper feed from tray 2.	79
MC5	3rd Feed	Starts paper feed from tray 3.	82
MC6	By-pass Feed	Starts paper feed from the by-pass table.	64
MC7	Duplex Transport	Drives the duplex transport rollers to transport the paper to the vertical transport rollers.	39
MC8	Duplex Feed	Starts paper feed out of the duplex tray to the duplex transport rollers.	38
Switches			
SW1	Main	Provides power to the copier.	117
SW2	Front Door Safety	Cuts the power line and detects is the front door is opened or not.	115
SW3	Toner Collection Bottle	Detects if the toner collection bottle is set or not.	128
SW4	2nd Paper Size	Determines what size paper is in the 2nd paper tray.	100
SW5	3rd Tray Set	Detects if the 3rd tray is set or not.	99
SW6	By-pass Table	Detects if by-pass feed table is open or closed.	62
Solenoids			
SOL1	Transfer Belt Positioning	Controls the up-down movement of the transfer belt unit.	34
SOL2	1st Pick-up	Controls the up-down movement of the pick-up roller in tray 1.	74
SOL3	2nd Pick-up	Controls the up-down movement of the pick-up roller in tray 2.	78
SOL4	3rd Pick-up	Controls the up-down movement of the pick-up roller in tray 3.	83
SOL5	By-pass Pick-up	Controls the up-down movement of the pick-up roller for by-pass feed.	63
SOL6	1st Separation Roller	Controls the up-down movement of the separation roller in tray 1.	76
SOL7	2nd Separation Roller	Controls the up-down movement of the separation roller in tray 2.	81
SOL8	3rd Separation Roller	Controls the up-down movement of the separation roller in tray 3.	84
SOL9	Right Tandem Lock	Locks the right tandem tray during transporting the paper from right tray to left tray.	96
SOL10	Left Tandem Lock	Locks the left tandem tray so that it can be separated from the right tandem tray.	101

Symbol	Name	Function	Index No.
SOL11	Front Side Fence	Controls the open and close movement of the front side fence.	54
SOL12	Rear Side Fence	Controls the open and close movement of the rear side fence.	49
SOL13	Duplex Positioning	Controls the up-down movement of the positioning roller.	40
SOL14	Pressure Arm	Presses the paper on the duplex tray against the duplex feed rollers.	44
SOL15	Guide Plate	Opens the guide plate when a paper misfeed occurs around this area.	67
SOL13	Junction Gate	Moves the junction gate to direct copies to the duplex tray or to the paper exit.	60
Sensors			
S1	Scanner HP	Informs the CPU when the 1st and 2nd scanners are at the home position.	2
S2	3 rd Scanner HP	Informs the CPU when the 3rd scanner is at the home position.	9
S3	Lens Vertical HP	Informs the CPU when the lens is at the full-size position.	7
S4	Lens Horizontal HP	Informs the CPU when the lens is at the horizontal home position.	12
S5	APS	Detects original size.	20
S6	Auto Image Density	Senses the background density of the original.	6
S7	Drum Potential	Detects the drum surface potential.	31
S8	Toner Density	Detects the amount of toner in the developer.	37
S9	Image Density	Detects the density of the ID sensor pattern on the drum.	32
S10	Toner Near End	Detects the toner end condition.	36
S11	1st Paper Feed	Controls the 1st paper feed clutch off/on timing and the 1st pick-up solenoid off timing.	91
S12	2nd Paper Feed	Controls the 2nd paper feed clutch off/on timing and the 2nd pick-up solenoid off timing.	89
S13	3rd Paper Feed	Controls the 3rd paper feed clutch off/on timing and the 3rd pick-up solenoid off timing.	87
S14	1st Lift	Detects when the paper in tray 1 is at the correct height for paper feed.	93
S15	2nd Lift	Detects when the paper in tray 2 is at the correct height for paper feed.	80
S16	3rd Lift	Detects when the paper in tray 3 is at the correct height for paper feed.	85
S17	1st Paper End	Informs the CPU when tray 1 runs out of paper.	92

Symbol	Name	Function	Index No.
S18	2nd Paper End	Informs the CPU when tray 2 runs out of paper.	90
S19	3rd Paper End	Informs the CPU when tray 3 runs out of paper.	88
S20	By-pass Paper End	Informs the CPU that there is no paper in the by-pass feed table.	65
S21	1st Paper Near End	Informs the CPU when the paper in tray 1 is almost finished.	53
S22	2nd Paper Near End	Informs the CPU when the paper in tray 2 is almost finished.	77
S23	3rd Paper Near End	Informs the CPU when the paper in tray 3 is almost finished.	86
S24	Right Tray Down	Informs the CPU when the bottom plate is completely lowered, to stop the 1st tray lift motor.	52
S25	Right Tray Paper	Detects whether there is paper in the right tandem tray.	50
S26	Front Side Fence Open	Informs the CPU when the front side fence is open.	58
S27	Front Side Fence Close	Informs the CPU when the front side fence is close.	57
S28	Rear Side Fence Open	Informs the CPU when the rear side fence is open.	48
S29	Rear Side Fence Close	Informs the CPU when the rear side fence is close.	47
S30	Rear Fence HP	Informs the CPU when the tandem tray rear fence is in the home position.	59
S31	Rear Fence Return	Informs the CPU when the tandem tray rear fence is in the return position.	51
S32	Left Tandem Paper	Informs the CPU when the left tandem tray runs out the paper.	56
S33	Paper Guide	Detects the misfeeds.	61
S34	Duplex Entrance	Detects the leading edge of the paper to determine duplex feed clutch off timing.	45
S35	Duplex Transport	Detects the leading edge of the paper to control the jogger motor and the positioning solenoid on timing.	42
S36	Duplex Exit	Detects the leading edge of the paper to determine duplex transport clutch on timing.	42
S37	Duplex Paper End	Detects the paper in the duplex tray.	46
S38	Jogger HP	Detects if the duplex jogger fences at the home position or not.	41
S39	Vertical Transport	Detects the leading edge of the paper to determine the paper feed timing of next sheet.	69
S40	Guide Plate Position	Detects whether the registration guide plate is closed.	68

Symbol	Name	Function	Index No.
S41	Registration	Detects misfeeds and controls the registration roller on-off timing.	70
S42	Fusing Exit	Detects misfeeds.	72
S43	Exit	Detects misfeeds.	73
S44	Auto Response	Returns the display from the screen saver.	17
S45	Toner Overflow	Detects when the toner collection bottle is full.	127
S46	Original Length (LT version only)	Detects the original length.	8
S47	Platen Cover Position 1 (Option)	Inform the CPU that the platen cover is in the up or down position (related to APS/ARE function).	3
S48	Platen Cover Position 2 (Option)	Inform the CPU that the platen cover is in the up or down position to detect if the original has been removed or not.	4
PCBs			
PCB1	Main	Controls all machine functions.	107
PCB2	AC Drive	Provides ac power to the fusing lamp and exposure lamp.	102
PCB3	DC Power Supply	Provides dc power.	110
PCB4	Optic Control	Controls all optics components.	105
PCB5	Paper Feed Control	Controls all components in the paper bank.	109
PCB6	Operation Panel Control	Controls LEDs and LCD on the operation panel.	15
PCB7	Left Operation Panel	Interfaces the LEDs, keys, and the auto response sensor on the left operation panel.	18
PCB8	Right Operation Panel	Interfaces the LEDs and keys on the right operation panel.	13
PCB9	By-pass Paper Size	Inform the CPU what size of the paper is in the by-pass feed table.	66
Lamps			
L1	Exposure Lamp	Applies high intensity light to the original for exposure.	23
L2	Fusing Lamps	Provide heat to the hot roller.	24
L3	Quenching	Neutralizes any charge remaining on the drum surface after cleaning.	28
L4	Erase	Discharge the drum outside of the image area.	29
L5	Pre-transfer	Reduce the charge on the drum surface before transfer.	33

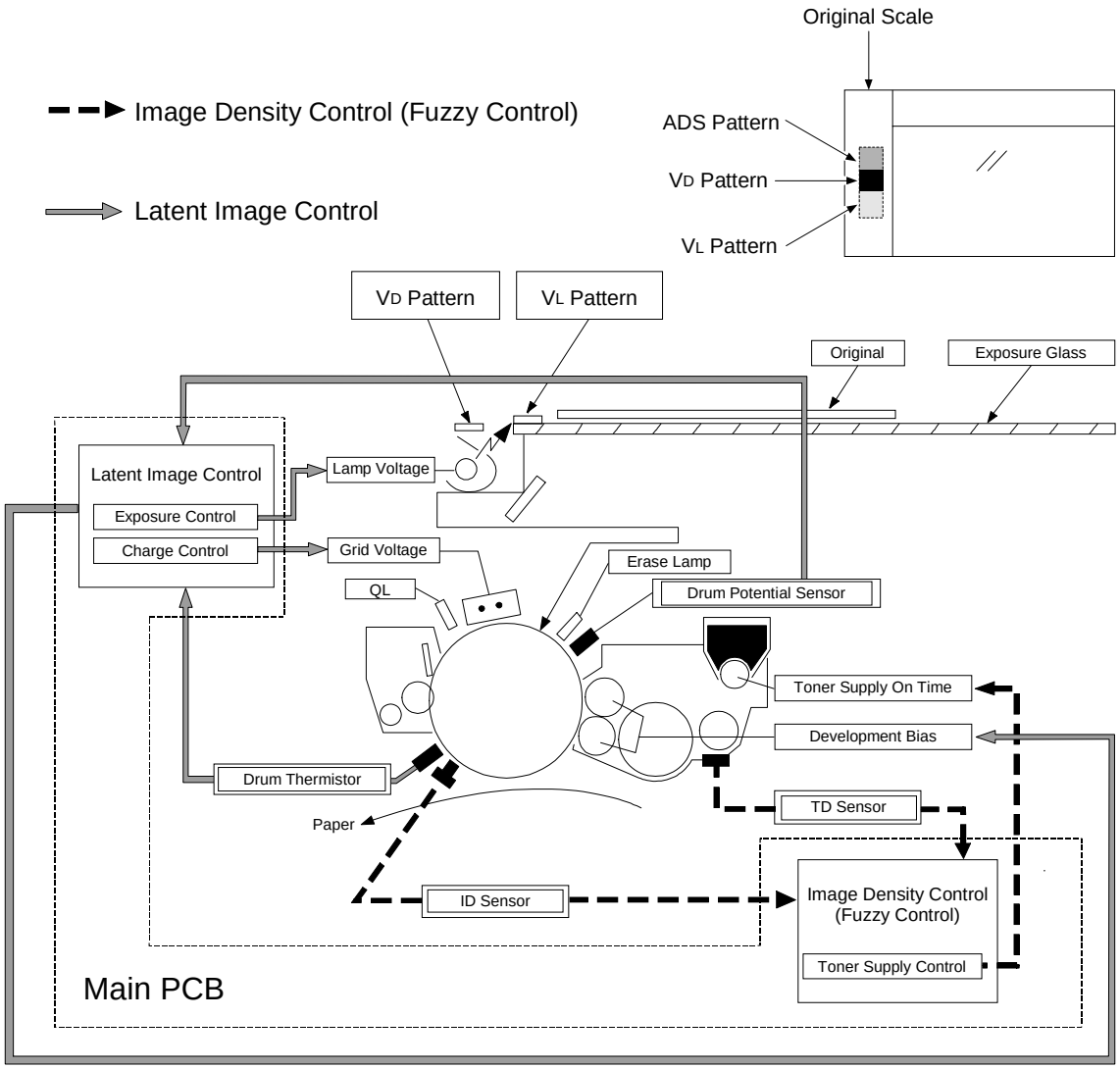
Symbol	Name	Function	Index No.
Power Packs			
PP1	Charge	Provides high voltage for the charge corona wires and the grid plate. Interfaces the QL, PTL, and charge wire cleaner motor control signals.	27
PP2	Development	Provides high voltage for the development unit. Interfaces the transfer p.p. and the charge p.p. signals.	108
PP3	Transfer	Provides high voltage for the transfer belt. Interfaces the transfer belt positioning solenoid control signal.	35
Heaters			
H1	Optic Anti-condensation	Turns on when the main switch is off to prevent moisture from forming on the optics.	16
H2	Transfer Anti-condensation	Turns on when the main switch is off to prevent moisture from forming on the optics.	134
H3	Upper Tray	Turns on when the main switch is off to keep paper dry in the paper tray.	131
H4	Lower Tray	Turns on when the main switch is off to keep paper dry in the paper tray.	130
Thermistors			
TH1	Optic	Monitors the temperature of the optics cavity.	1
TH2	Fusing	Detects the temperature of the hot roller.	25
TH3	Drum	Monitors the temperature of the OPC drum.	32
Others			
CB1	Circuit Breaker	Provides back-up high current protection for the electrical components.	113
CO1	Total Counter	Keeps track of the total number of copies made.	132
CO2	Key Counter	Keeps track of the total number of copies made when the key counter is set.	-
LA1	Lightening Arrestor	Removes current surges from the ac input lines.	116
LCD1	LCD	Displays the operation menus and messages.	14
NF1	Noise Filter	Remove the electrical noise.	112
RA1	Main Power Relay	Controls main power.	103
TF1	Fusing Thermofuse	Opens the fusing lamp circuit if the fusing unit overheats.	26

Symbol	Name	Function	Index No.
TR1	Transformer (220 V version only)	Makes power for the exposure lamp.	111
TS1	Optics Thermoswitch	Opens the exposure lamp circuit if the optics unit overheats.	22

2. DETAILED SECTION DESCRIPTIONS

2.1 PROCESS CONTROL

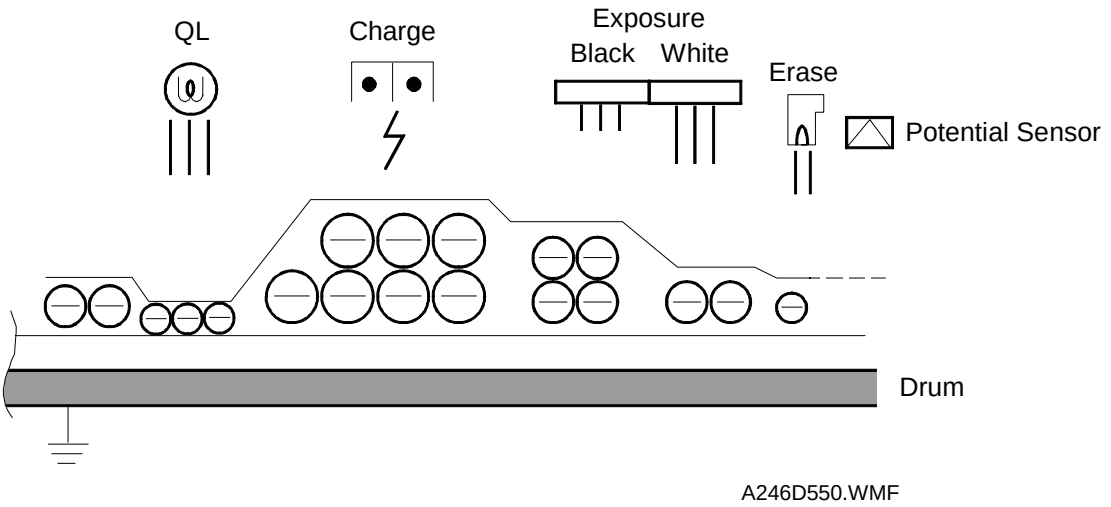
2.1.1 OVERVIEW



A246D529.WMF

This model uses two process control methods. One compensates for variation in the drum potential (latent image control) and the other controls the toner concentration and toner supply amount (image density control).

Latent Image Control



The figure shows drum potential changes during the copy process.

V_O:	The drum potential just after charging the drum.
V_D (Dark Potential):	The drum potential just after exposing the black pattern (V_D pattern)
V_L (Light Potential):	The drum potential just after exposing the white pattern (V_L pattern)
V_R (Residual Voltage):	The drum potential just after the exposure to the erase lamp.

After long usage following installation or a PM, drum potential will gradually increase due to the following factors:

- Dirty optics or exposure lamp deterioration
- A dirty charge corona casing and grid plate
- A change in drum sensitivity

In this copier, the drum potential sensor detects the change in drum potential and controls the following items to maintain good copy quality:

- The grid-bias voltage
- The exposure lamp voltage
- The development bias voltage.

A drum thermistor detects the drum temperature and acquires data. The thermistor uses this data to control the above voltages. It is impossible to explain this process simply because it is controlled by methods developed in our laboratories using an artificial neural network.

Image Density Control

The following sensors control image density:

- Toner Density sensor (TD sensor)
- Image Density sensor (ID sensor)

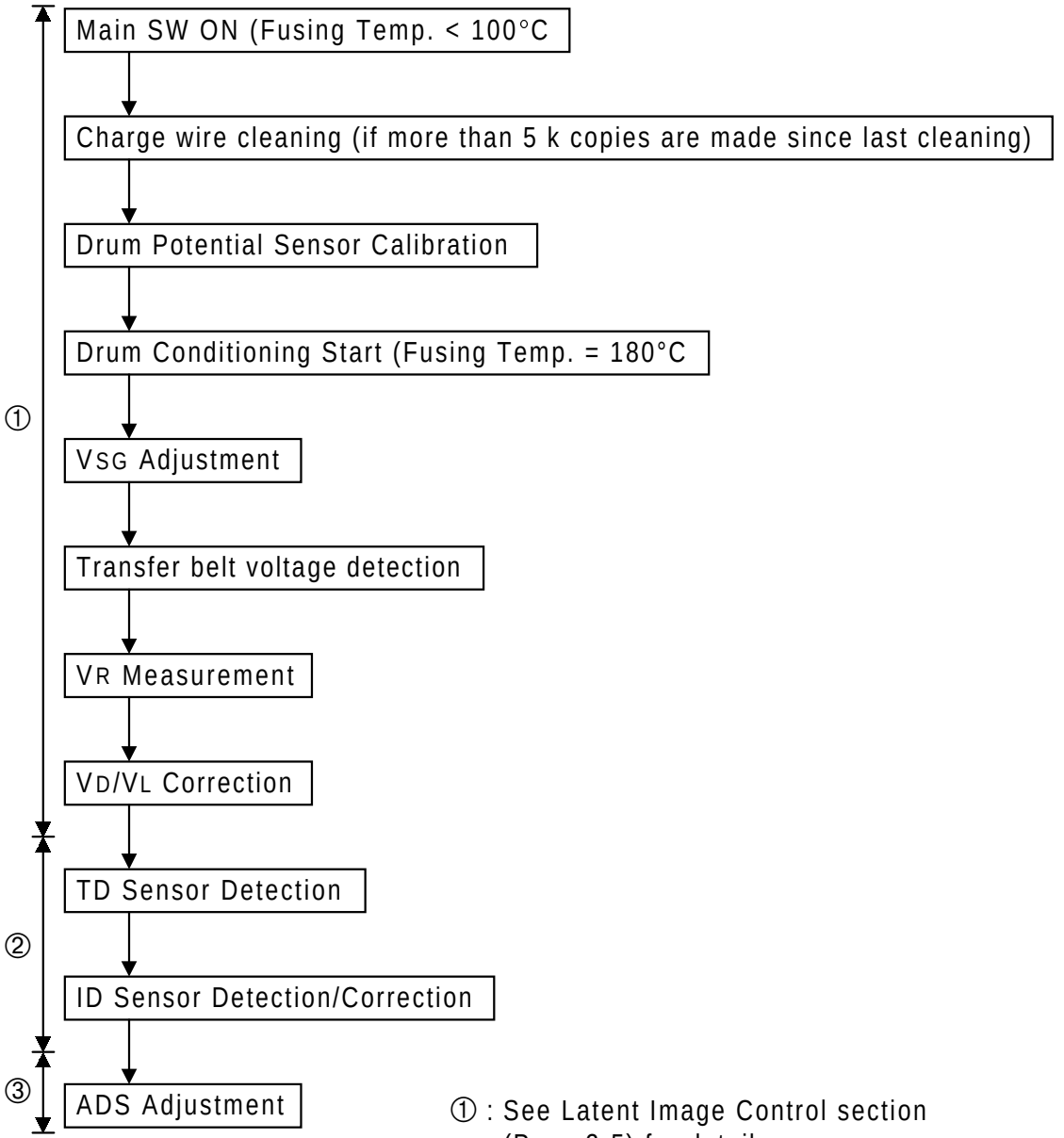
Data from the TD sensor maintains the toner concentration in the developer at a constant level. However, the image on the OPC drum varies due to the variation in toner chargeability (influenced by the environment), even if the toner concentration is constant. Toner concentration changes to maintain the image density on the OPC drum because of compensation by the ID sensor.

The following items are controlled to maintain a constant copy image density:

- Toner supply clutch on time
- Toner supply level data (V_{REF}) of the TD sensor

2.1.2 PROCESS CONTROL DATA INITIAL SETTING

The following flow chart shows the steps performed when turning on the machine while the hot roller temperature is below 100°C. This initializes all the process control settings.



① : See Latent Image Control section (Page 2-5) for details.

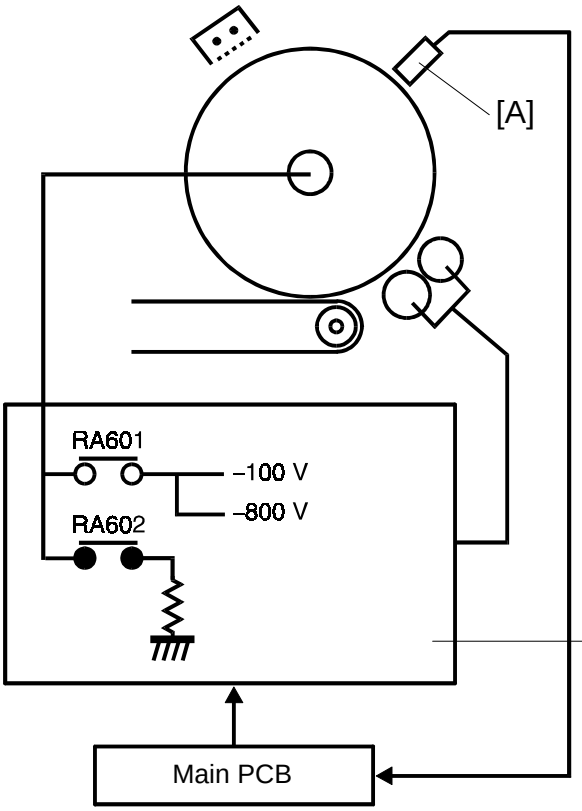
② : See Image Density Control section (Page 2-12) for deteails.

③ : See Optics section (Page 2-44) for details.

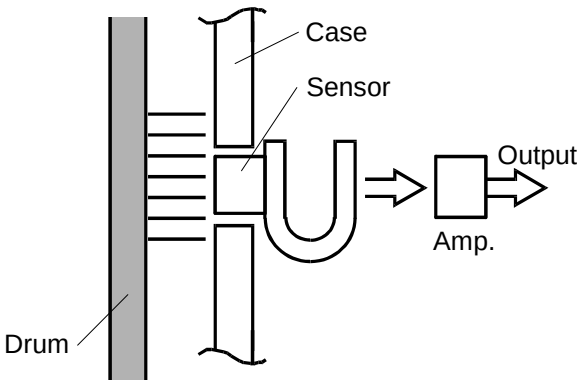
A246D551.WMF

2.1.3 LATENT IMAGE CONTROL

Drum Potential Sensor Calibration



A246D552.WMF



A246D554.WMF

The potential sensor [A] for the drum is just above the development unit. The sensor has a detector that detects the strength of the electric field from the electric potential on the drum. The output of the sensor depends on the strength of the electric field.

Since environmental conditions affect sensor output, such as temperature and humidity, the sensor output is calibrated during process control data initialization.

The High Voltage Control PCB [B] has two relay contacts. Usually RA602 grounds the drum. However, during the initial setting, the main PCB turns RA601 on and RA602 off and applies the voltage to the drum shaft.

By measuring the output of the drum potential sensor when –100 V and –800 V are applied to the drum, the sensor output is calibrated automatically. (The machine recognizes the relationship between actual drum potential and the potential sensor output.)

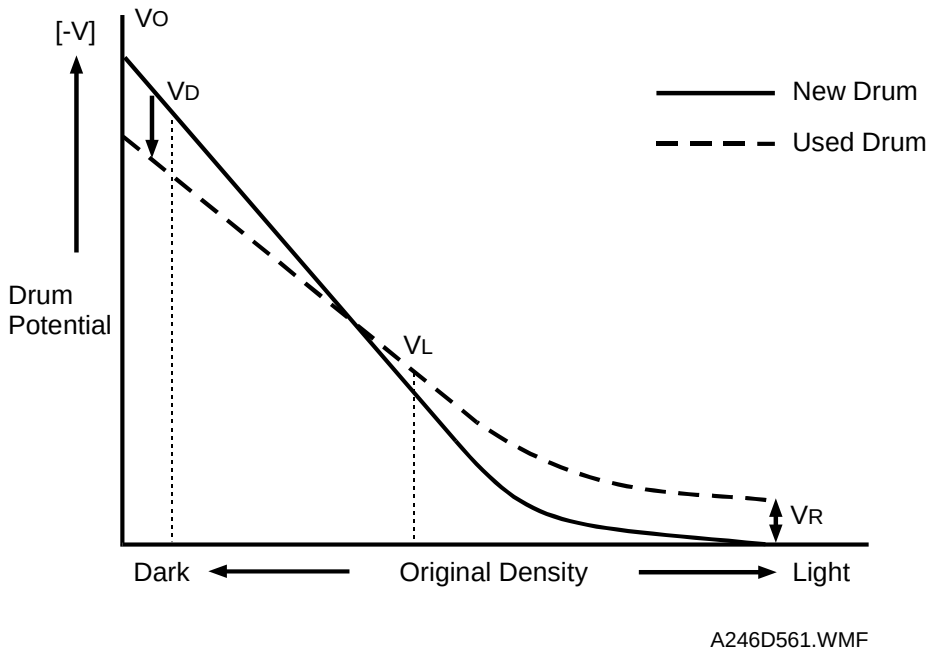
Drum Conditioning

When the fusing temperature reaches 180°C, the machine starts the drum conditioning process. In this mode, the main motor, main charge corona, erase lamp and development bias are activated for about 30 seconds and drum sensitivity and residual voltage (V_R) are stabilized, as in continuous copy runs.

V_{SG} Adjustment

During drum conditioning, the ID sensor checks the reflectivity of the bare drum and calibrates the output of the ID sensor to 4 ± 0.2 V.

V_R Measurement



The above figure shows the relationship between the drum potential and the original density. This relationship must persist to maintain copy quality.

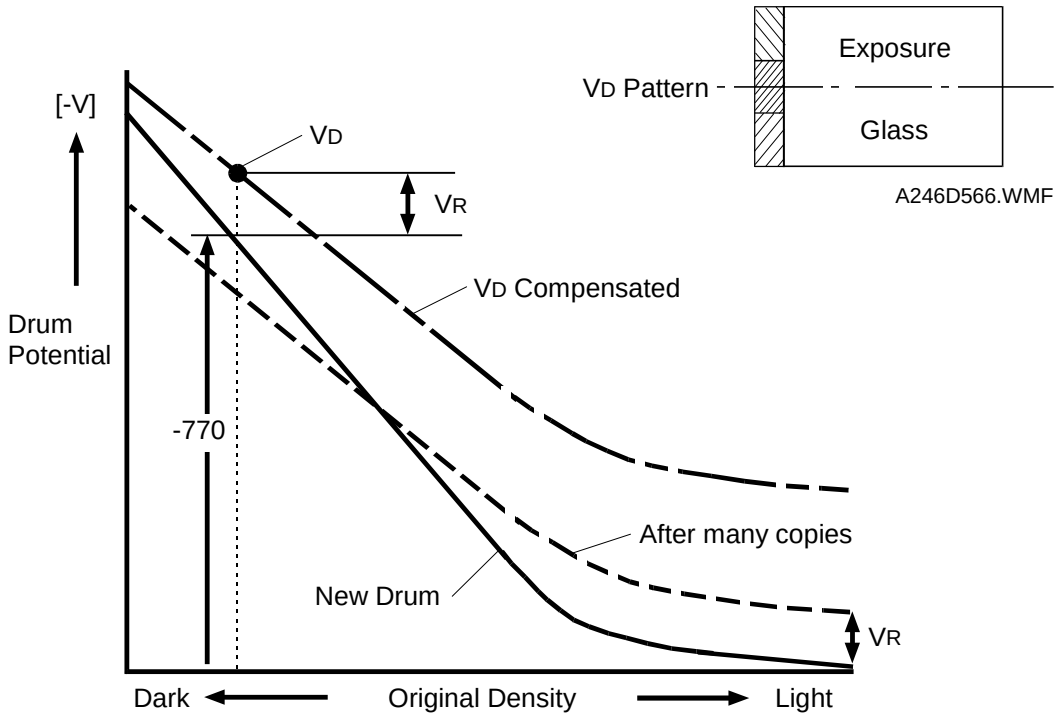
Since this relationship tends to change to the one represented by the dotted line by various factors, some compensation is necessary.

Increasing the exposure lamp voltage cannot compensate for the residual voltage (V_R). Therefore, other means are required to compensate for V_R change.

The main control board checks the drum potential just after the erase lamp exposure with the drum potential sensor, after drum conditioning. This measured drum potential is in fact V_R. This V_R is the standard for the V_D and V_L corrections.

NOTE: In the figure above, the residual voltage (V_R) for the new drum is 0 V. Actually, there is some residual voltage even on a new drum.

VD Correction



The drum potential just after the black pattern (V_D Pattern) is exposed (V_D: Dark Potential) tends to lower during drum life due to a decrease in the capacity of the drum to carry a charge.

To check the actual V_D, the first scanner moves to the home position, exposing the V_D pattern (Black) stuck on the bottom side of the exposure glass bracket on the drum.

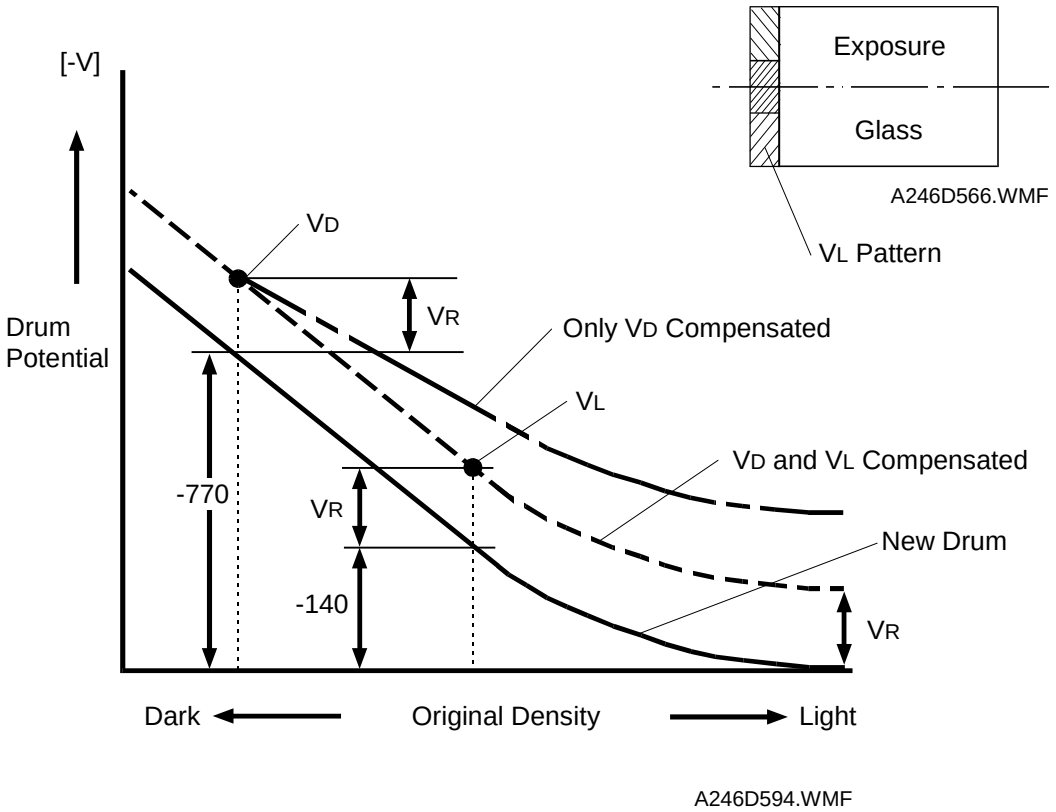
The main control board measures V_D using the drum potential sensor and adjusts it to a target value by adjusting the grid-bias voltage (V_{GRID}).

On the other hand, the drum residual voltage (V_R) changes to compensate for the target V_D voltage in the following manner:

Target V_D Value: $V_D = V_R + (-770)$

The adjusted grid-bias voltage (V_{GRID}) remains in memory until the next process control data initialization.

V_L Correction



Dirty optics and/or exposure lamp deterioration decreases the intensity of the light that reaches the drum. In addition to this, the drum sensitivity also changes during the life of the drum. These factors change the drum potential just after white pattern exposure (V_L: Light Potential).

To check the actual V_L, the lens moves to the V_L pattern check position. This exposes the V_L pattern (White) stuck underneath the original scale on the drum.

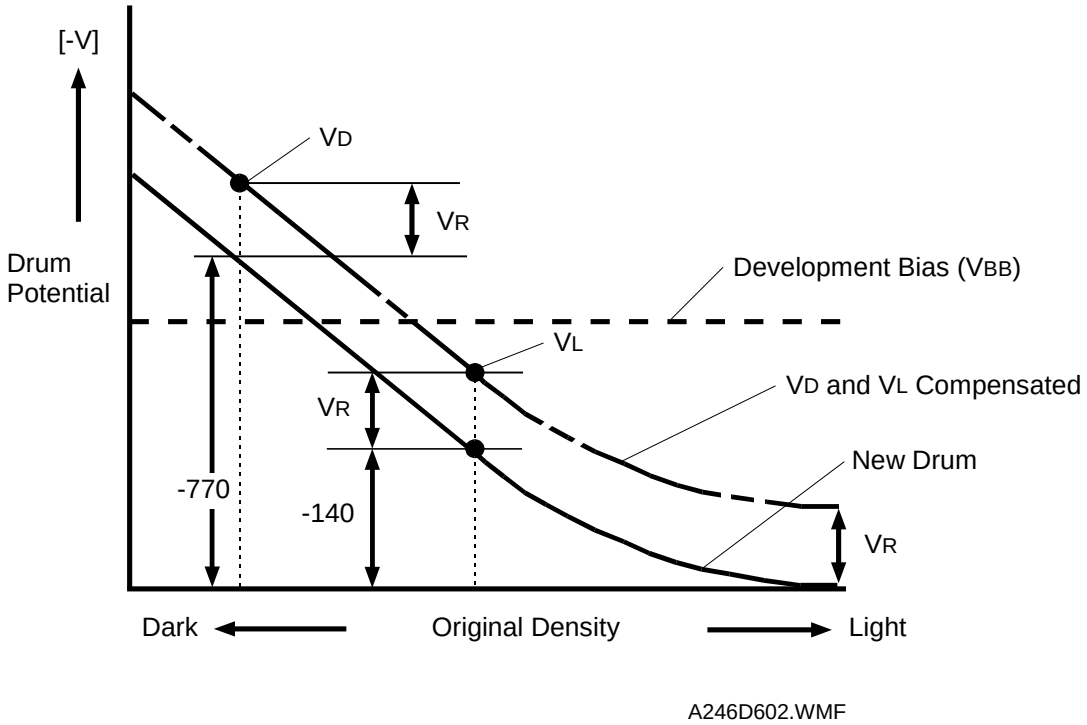
The main control board measures V_L using the drum potential sensor and adjusts it to a target value by adjusting the exposure lamp voltage (V_{LAMP}).

The residual voltage (V_R) change also affects V_L, to compensate for the target voltage of V_L in the following manner:

Target V_L Value: $V_L = V_R + (-140)$

The adjusted exposure lamp voltage (V_{LAMP}) is stored in memory until the next initial setting of the process control data.

VR Correction



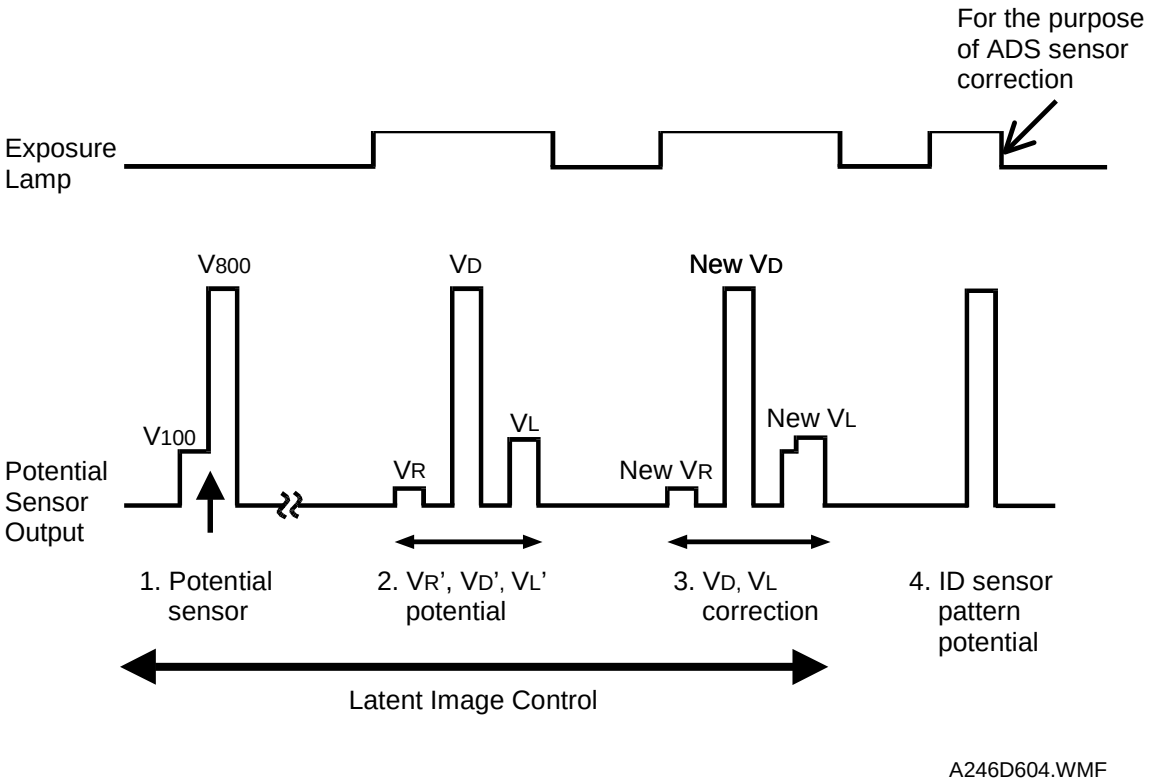
The potential sensor monitors potentials (V_R, V_D, and V_L). During the check cycle, the V_D and V_L patterns are exposed. The potential sensor checks the drum potential in the area exposed by each pattern.

Compare the curve of the V_D and V_L compensated drum potential with the curve of the new drum, they are parallel but the compensated potential is still higher (V_R) than the new drum potential. To prevent dirty backgrounds due to increased residual potential, development bias (V_{BB}) is applied as follows:

$$V_{BB} = V_R + (-220)$$

Initial Setting Sequence

The following graph shows the sequence of events during the initial setting of the process control data.



1. Potential sensor calibration
   Measuring the output of the drum potential sensor when applying –100 V and –800 V to the drum, automatically calibrates the sensor output (V_{100} and V_{800}). See page 2-5 for details.
2. V_R, V_D, V_L potential detection
   After about 30 seconds of drum conditioning, V_D and V_L Patterns are developed by using the previous grid-bias voltage (V_{GRID}) data and exposure lamp voltage (V_{LAMP}) data to detect the V_R, V_D, V_L data.

   The machine calculates the new V_{GRID} and V_{LAMP} data using the detected V_R, V_D, and V_L data.

3. V_D and V_L corrections
   Using the calculated V_{GRID} and V_{LAMP} data, the V_R, V_D, and V_L patterns are redeveloped thereby determining the new V_R, V_D, and V_L data. If both V_D and V_L data are within specifications, the new V_D, V_L, and V_R values determine the new V_{GRID}, V_{LAMP} and development bias (V_{BB}).

Specifications:

$V_D = -770 + V_R \pm 20$ V
$V_L = -140 + V_R \pm 20$ V

If V_D is outside specifications, V_{GRID} is shifted one step. Then the V_D pattern is re-measured and V_D is detected again. The same is done for V_L and V_{LAMP}. The above process continues until both V_D and V_L fall within specifications. The graph on the previous page shows an example of when only V_L was outside the specifications at the first V_L detection. It came within specifications after one V_L correction by changing V_{LAMP} 0.5 V/step, and V_{GRID} by 20 V/step.

The machine stops V_D/V_L correction and uses the previous V_{GRID} and V_{LAMP} values during copying in the following instances:

- If V_{100} or V_{800} at the calibration of the drum potential sensor is outside specifications.
- If V_D or V_L does not fall within specifications after shifting V_{GRID} or V_{LAMP} to their maximum and/or minimum levels.

In this case, the machine indicates nothing, but the SC counter increments.

Related SC codes (see troubleshooting section for details):

Code	Condition
361	Incomplete drum potential sensor calibration
364	Abnormal V_D detection
365	Abnormal V_L detection
366	V_R abnormal

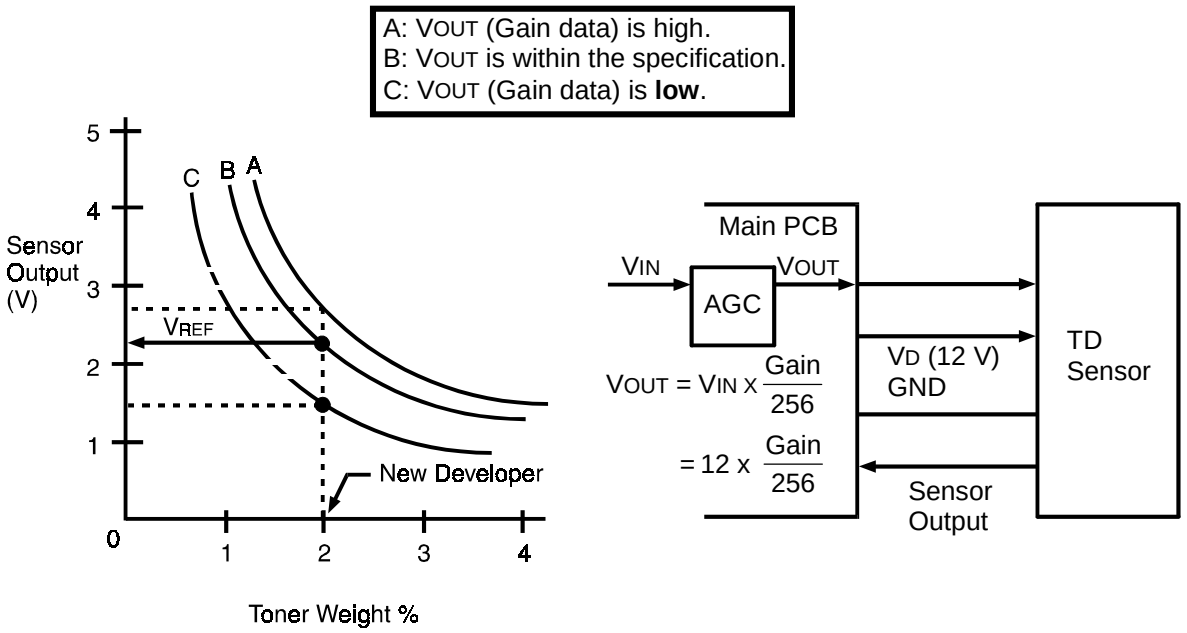
Utilizing V_R in the following manner can also determine the development bias:

$V_{BB} = V_R + (-220)$

4. The ID sensor pattern for potential detection
   This determines the ID Sensor Bias Voltage. The development control section explains this subject in more detail (see page 2-16).

2.1.4 IMAGE DENSITY CONTROL

Toner Density Sensor



A246D531.WMF

A246D606.WMF

Developer consists of carrier particles (iron) and toner particles (resin and carbon). Inside the development unit, developer passes through a magnetic field created by coils inside the toner density sensor. When the toner concentration changes, the voltage output by the sensor changes accordingly.

<*Toner Density Sensor Initial Setting*>

When installing new developer with the standard toner concentration (2.0% by weight, 20 g of toner in 1,000 g of developer), the initial setting for the developer must be performed by using an SP mode (SP1-2-1).

During this setting, the output voltage (VOUT) from the auto gain control circuit (AGC) on the main control board PCB varies to change the output voltage from the toner density (TD) sensor. Changing the gain data does this:

$$V_{OUT} = V_{IN} \times \frac{\text{Gain Data}}{256} = 12 \times \frac{\text{Gain Data}}{256}$$

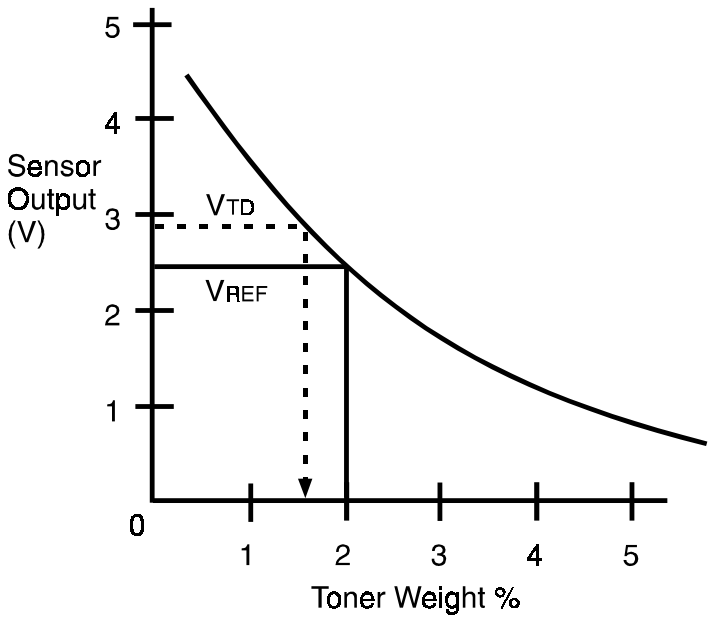
If the data is large, VOUT and the sensor output voltage also become large. This results in the sensor sensitivity illustrated by curve A. If the data is small, VOUT becomes small, and the sensor output voltage becomes small. As a result, the sensor sensitivity shifts as illustrated by curve C.

By selecting the proper gain data, the sensor output is set within the targeted control level (V_{REF}, V_{REF} = 2.5 ± 0.1 V). Now, curve B shows the sensor characteristic and the TD sensor initial setting is complete.

The selected gain data is stored in memory, and V_{OUT} from the auto-gain control circuit stays constant during the detection cycle for the toner sensor.

<Toner Supply Criteria>

Toner density detection in the developer occurs once in every copy cycle. The sensor output voltage (V_{TD}) during the detection cycle is compared with the toner supply level voltage (V_{REF}).

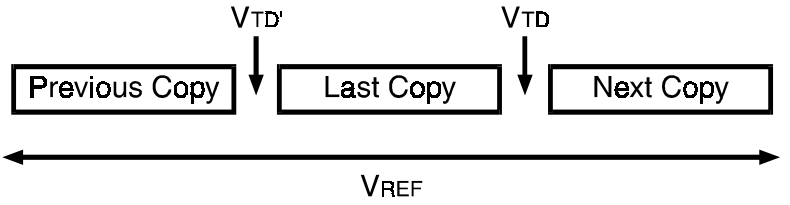


A246D609.WMF

<*Toner Supply Clutch on Period*>

To stabilize toner concentration, the toner supply (toner supply clutch ON period) is controlled by using VREF and VTD data.
The toner supply is calculated after each copy. The following factors determine the remaining toner supply:

① VREF – VTD
② VREF – VTD' (VTD' = VTD of the previous copy cycle)



A246D512.WMF

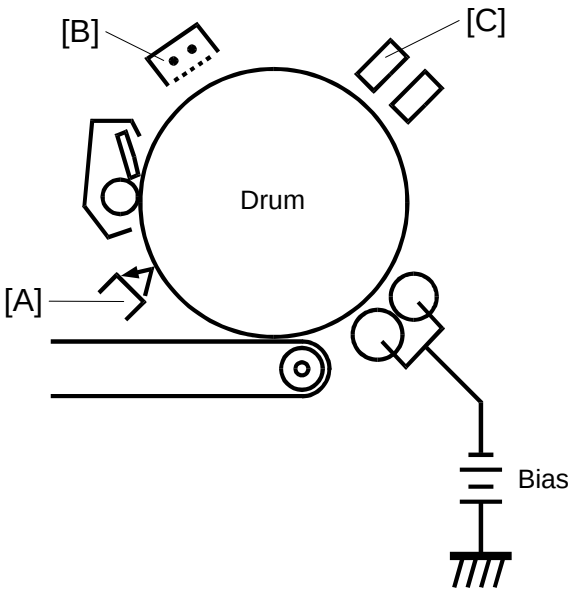
By referring to these factors, the machine recognizes the difference between the current and target toner concentration. The machine also understands how much the toner concentration changed and can predict how much the toner supply amount will probably change.
Precision changes in the toner supply maintain the toner concentration (image density). Since updating the toner supply clutch ON period is under fuzzy control, the relation among VTD, VTD', VREF cannot be expressed by a simple algebraic formula.

<*VREF Correction*>

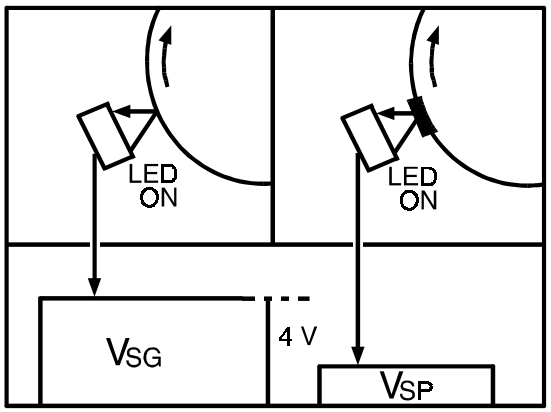
The image on the OPC drum changes due to the variation in toner chargeability (influenced by the environment) even if the toner concentration is constant. The image density sensor (ID sensor) directly checks the image on the OPC drum and shifts VREF data (under fuzzy control) to keep the image on the OPC drum constant, as explained in the next section.

NOTE: 1) The toner end sensor detects the toner end condition (see the development section for details).
2) The toner supply clutch turns on at intervals between each copy process, while image development is not occurring.

Image Density Sensor Detection



A246D513.WMF

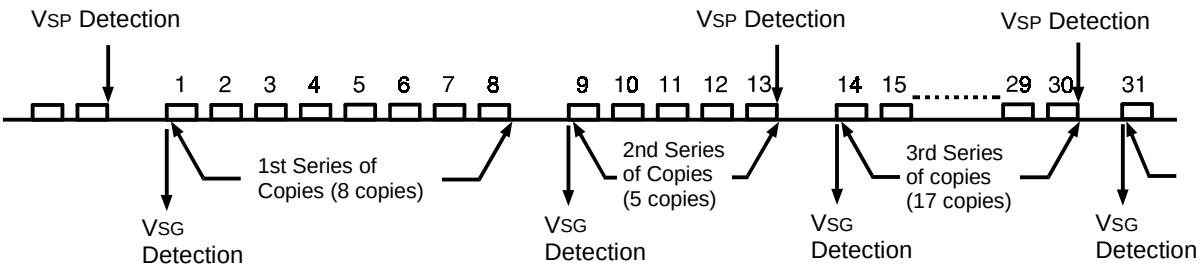


A246D514.WMF

The ID sensor [A] checks VSG and VSP. The ID sensor is located underneath the drum cleaning section.
There is no ID sensor pattern in the optics; however, the charge corona unit [B] and the erase lamp [C] make a pattern image on the OPC drum.

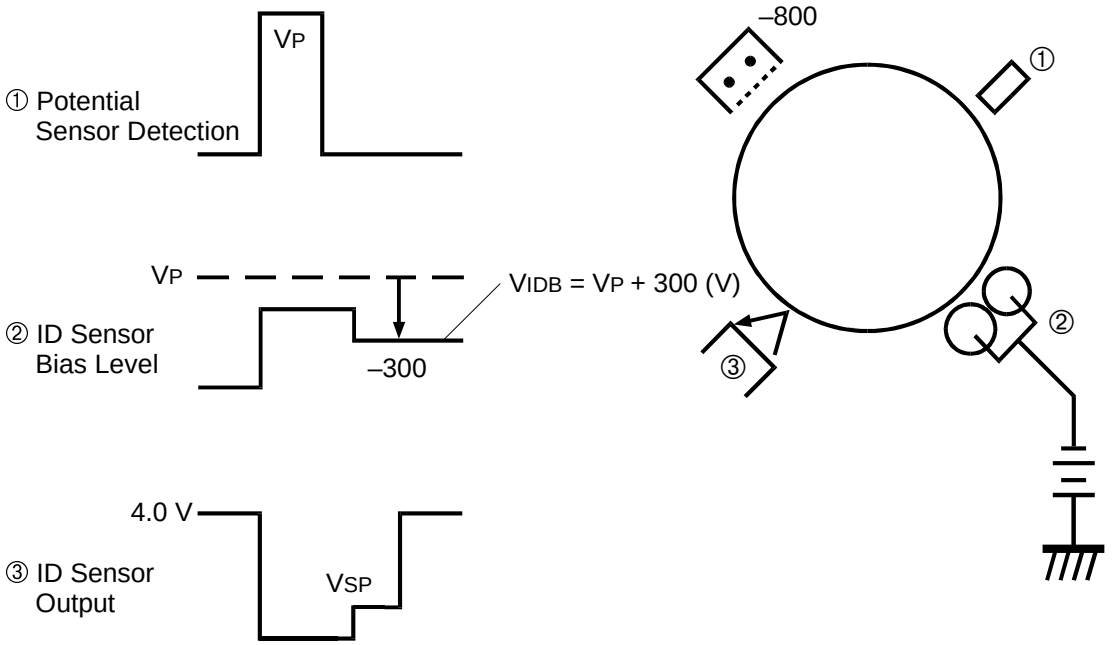
VSG is the ID sensor output when checking the erased drum surface.
VSP is the ID sensor output when checking the ID sensor pattern image.

To compensate for any variation in light intensity from the sensor LED, the reflectivity of both the erased drum surface and the pattern on the drum are checked.



A246D515.WMF

VSG is detected every time the machine starts copying.
During VSG detection, the development sleeve rollers do not rotate and development bias is not applied.
If 10 or more copies are made, the copier will re-detect VSP. Since the transfer belt must be released when checking VSP, the machine cannot check the VSP during continuous copying.



A246D516.WMF

A246D517.WMF

While developing the ID sensor pattern, ID sensor bias is applied. ID sensor bias is determined during process control data initialization as follows:

Apply charge while the grid voltage is –800 V to create the ID sensor pattern.

Check the drum potential (V_P) of the latent image created by the charge with –800 V grid.

Adjust the ID sensor bias (V_{IDB}) so that it satisfies the following formula:

$$V_{IDB} = VP - (-300)\ (V)$$
$$= VP + 300\ (V)$$

Change the bias to the calculated V_{IDB} and detect V_{SP}. The V_{SG} value detected during its adjustment sequence during process control data initialization and the V_{SP} determine the V_{REF} data. The V_{IDB} does not change until the next initial setting for the process control data.

<*V_{REF} Correction Timing*>

After the series of copies is completed, when 10 or more copies were made, V_{REF} is updated by referring to the previous V_{REF} (V_{REF}'), V_{SG}, V_{SP} and the current TD sensor output (V_{TD}).

Since this V_{REF} data updating is under fuzzy control, the relationship among V_{REF}, V_{REF}', V_{SG}, V_{SP} and V_{TD} cannot be expressed in a simple algebraic formula.

The V_{REF} is not only updated in the above case, but also during the initial setting for the developer and during process control data initialization.

Sensor Abnormal Conditions

a) ID sensor (V_{SG}, V_{SP}) abnormal

Whenever V_{SG} falls under 2.5 V or V_{SP} rises over 2.5 V, the CPU fixes the V_{REF} data and the TD sensor output controls the toner concentration.

Normal detection of V_{SG} and V_{SP} occurs, as usual, during abnormal conditions. If output returns to normal levels ($V_{SG} \geq 2.5$ V, $V_{SP} \leq 2.5$ V), the CPU returns the toner concentration control to normal mode.

b) TD sensor (V_{TD}) abnormal

Whenever V_{TD} rises over 4.0 V or falls under 0.5 V, the CPU shifts the toner supply to the fixed supply mode. In this condition, the CPU never stops the toner supply. The fixed toner supply can be changed in four steps (4%, 7%, 11%, and 14%) by using an SP mode. The default fixed toner supply is 4%.

Detection of V_{TD} still occurs, as usual, during abnormal conditions. If its output returns to a normal level, the CPU returns the toner concentration control to normal mode.

c) Drum Potential Sensor abnormal

The CPU shifts the toner supply to fixed supply mode, when the TD sensor (V_{TD}) detects an abnormal condition, in the following cases:

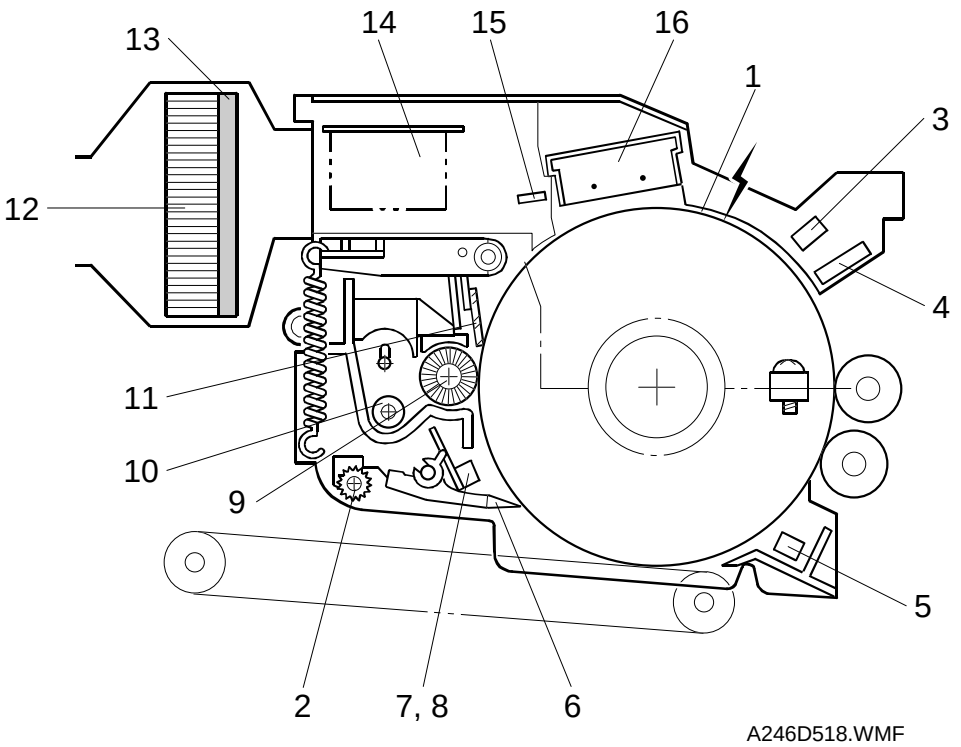
- V_{100} rises over 0.7 V or falls under 0.1 V
- V_{800} rises over 4.2 V or falls under 2.7 V

Related SC codes. (See troubleshooting section of details.):

Code	Condition
351	Abnormal V_{SG} Detection ($V_{SG} > 4.2$ V)
352	Incomplete TD Sensor Initial Setting
353	Abnormal V_{SP} Detection ($V_{SP} > 2.5$ V)
354	Abnormal V_{SG} Detection ($V_{SG} \leq 2.5$ V)
355	Abnormal V_{TD} Detection ($V_{TD} > 4.7$ V)
356	Abnormal V_{TD} Detection ($V_{TD} < 0.5$ V)
358	Abnormal V_{SP}/V_{SG} Detection ($V_{SP}/V_{SG} < 0.025$ V)
361	Incomplete Drum Potential Sensor Calibration

2.2 DRUM UNIT

2.2.1 OVERVIEW



The drum unit consists of the components as shown in the above illustration. This model uses an organic photoconductor drum (diameter: 100 mm).

1. OPC Drum
2. Paper Guide Spurs (60/70 cpm only)
3. Erase Lamp
4. Drum Potential Sensor
5. Pre-transfer Lamp
6. Pick-off Pawl
7. Image Density Sensor
8. Drum Thermistor
9. Cleaning Brush
10. Toner Collection Coil
11. Cleaning Blade
12. Ozone Filter
13. Cleaning Filter
14. Charge Power Pack
15. Quenching Lamp
16. Main Charge Corona Unit

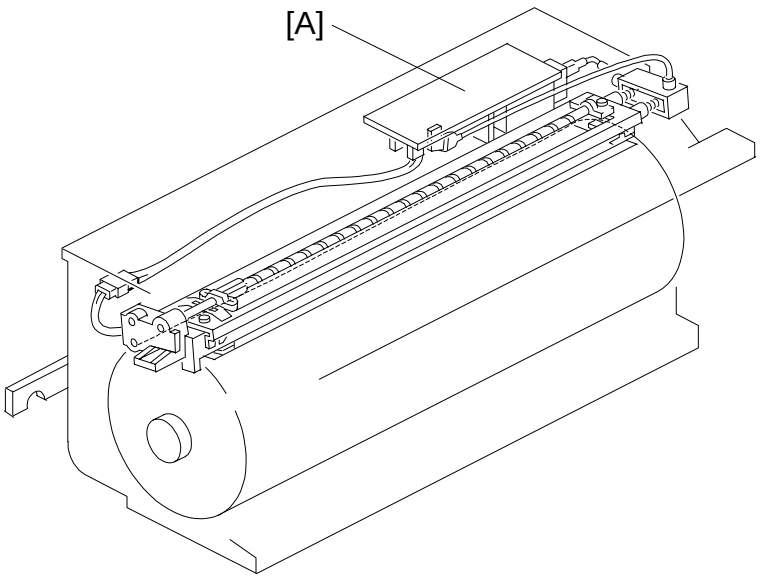
2.2.2 OPC DRUM CHARACTERISTICS

An OPC has the following characteristics:

1) Accepts a high negative electrical charge in the dark. (The electrical resistance of a photoconductor is higher with the absence of light.)
2) Dissipates the electrical charge when exposed to light. (Exposure to light greatly increases the conductivity of a photoconductor.)
3) Dissipates an amount of charge in direct proportion to the intensity of the light. That is, the stronger the light focused on the photoconductor surface is, the smaller the voltage remaining on the OPC.
4) Less sensitive to changes in temperature (when compared to selenium F type drums).
5) Less sensitive to changes in rest time (light fatigue). This makes it unnecessary to compensate for the development bias voltage resulting from variations in the rest time.

2.2.3 DRUM CHARGE

Overview

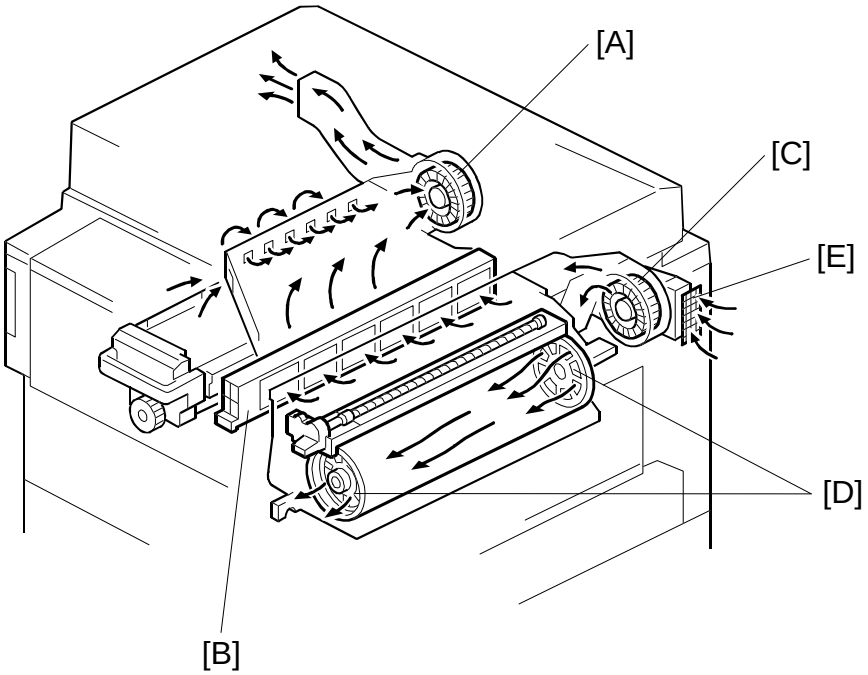


A246D519.WMF

This copier uses a double corona wire scorotron system for the drum charge. Two corona wires are required to give sufficient negative charge on the drum surface because of a rather high drum speed (50/51 cpm machine: 330 mm/seconds, 60 and 70 cpm machines: 430 mm/seconds.). The stainless steel grid plate makes the corona charge uniform and controls the amount of negative charge on the drum surface by applying negative grid-bias voltage.

The charge power pack [A] supplies constant current to the corona wires (–1,200 μA). Bias voltage supplied to the grid plate is automatically controlled to maintain proper image density even if the OPC drum potential changes due to a dirty grid plate or the charge corona casing.

Air Flow Around the Drum



A246D520.WMF

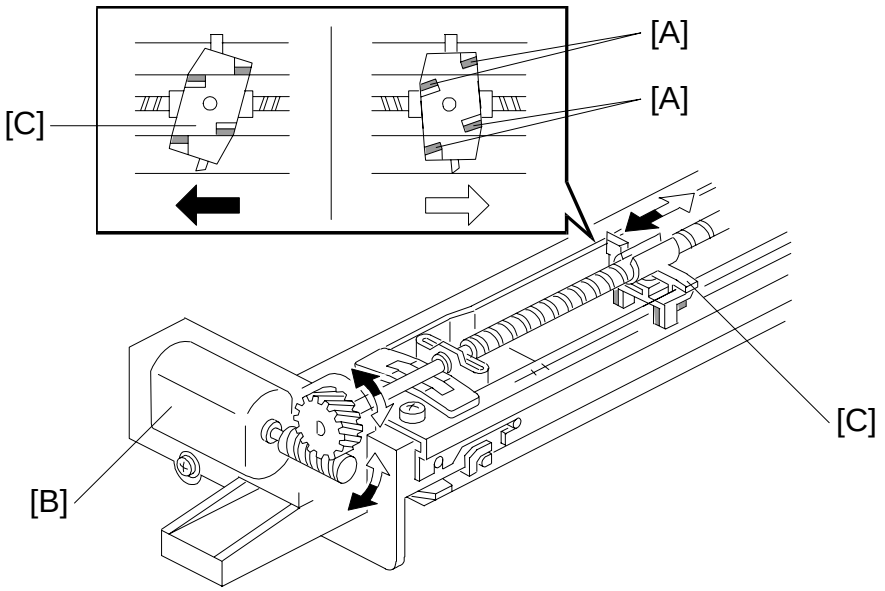
The exhaust fan [A] located above the fusing unit provides an airflow to the charge corona unit to prevent uneven build-up of negative ions that can cause an uneven charge on the drum surface as shown.

An ozone filter [B] absorbs the ozone (O_3) around the drum.

The exhaust fan rotates slowly during stand-by and rotates quickly during copying to keep the temperature inside the machine constant.

There is another fan (the drum-cooling fan [C]), which is located on the right rear side of the machine (front view). The drum-cooling fan cools the drum unit to remove the heat from the duplex tray. The drum has 12 holes in each drum flange [D]. Air flows into the drum, through the holes in the drum flange. To prevent foreign matter from entering the inside of the copier, there is a dust protection filter in the entrance [E] of the duct.

Charge Wire Cleaning Mechanism



A246D521.WMF

The flow of air around the charge corona wire may deposit toner particles on the corona wires. These particles may interfere with charging and cause low-density bands on copies.

The wire cleaner pads [A] automatically clean the wires to prevent such a problem.

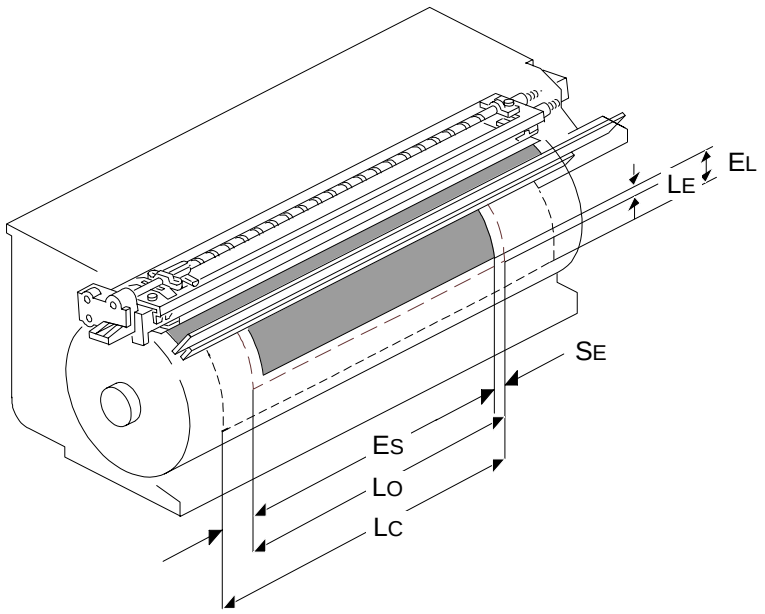
A DC motor [B] drives the wire cleaner. Normally the wire cleaner [C] is in the front-end position (home position). After 5,000 copies and when the fusing temperature is less than 100°C after the main switch is turned on, the wire cleaner motor brings the wire cleaner to the rear end and then back to the home position.

When the wire cleaner moves from the rear to the home position (black arrow in the illustration), the wire cleaner pads clean the wires.

There are no home-position and return-position sensors. The CPU monitors the input voltage (5 V). When the wire cleaner reaches the end, it is stopped and the motor locks. At this time, input voltage slightly decreases (to about 4 V) and the CPU determines when to reverse the motor.

2.2.4 ERASE

Overview



A246D522.WMF

LE:	Lead edge erase margin	3.5 ± 2.5 mm
SE:	Side erase margin	total of both sides 3 mm or less
LO:	Original width	
LC:	Charged width of drum	
EL:	Lead edge erase	
ES:	Side erase	

The erase lamp unit consists of a line of 123 LEDs extending across the full width of the drum, the width of each being about 2.5 mm. In editing mode, the customer determines the active LEDs.

Lead Edge and Trail Edge Erase

The entire line of LEDs turns on when the main motor turns on. They stay on until the erase margin slightly overlaps the leading edge of the original image on the drum (leading edge erase margin). It prevents the shadow of the original leading edge from appearing on the copy paper. This lead erase margin is also necessary for the leading edge of the copy paper to separate from the hot roller. An SP mode can adjust the width of the leading edge erase margin (SP1-2-4).

When the scanner reaches the return position, the charge corona, the grid bias, and the exposure lamp turn off. However, the charged area on the drum surface is a little longer than the original length in order to capture the entire latent image of the original.
The entire line of LEDs turns on when the trail edge of the latent image passes under the erase lamp unit. This prevents developing unnecessary parts of the drum surface; thereby reducing toner consumption and drum cleaning load.
The LEDs remain on, erasing the leading edge of the latent image in the next copy cycle. After the final copy, the erase lamps turn off at the same time as the main motor.

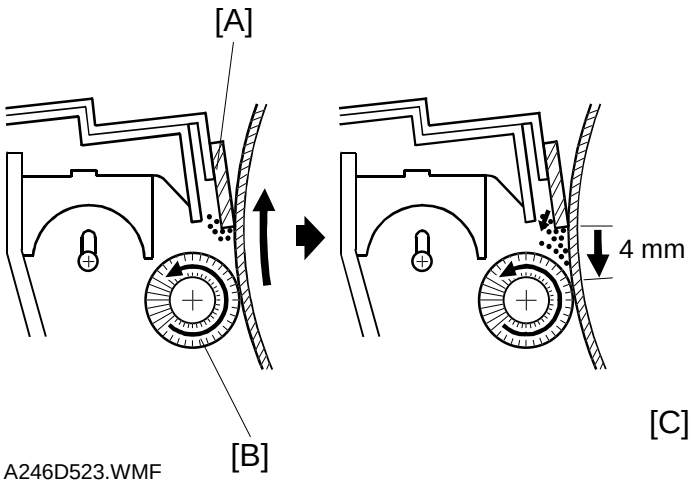
Side Erase

Based on the combination of copy paper size and the reproduction ratio data, the LEDs turn on in blocks. This prevents the shadow of the original side edge and unexposed front and rear sides of the drum surface in reduction mode from being developed. This reduces toner consumption and drum cleaning load.

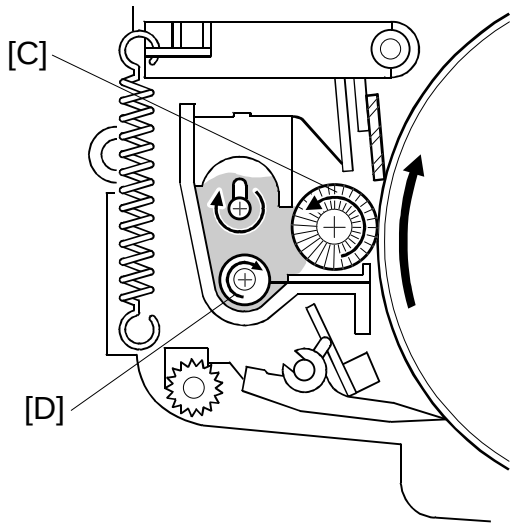
In the DJF mode, the horizontal original standard position on the exposure glass is 5 mm away from the rear scale.
On the other hand, the horizontal original standard position on the exposure glass in the platen cover mode is the rear scale edge.
One more LED at the front side turns on to erase the shadow made by the edge of the rear scale in platen cover mode. This is in addition to the LEDs that are on in DJF mode.

2.2.5 CLEANING

Overview



A246D523.WMF



A246D524.WMF

This copier uses the counter blade system for drum cleaning.
The blade [A] is angled against the drum rotation. This counter blade system has the following advantages:

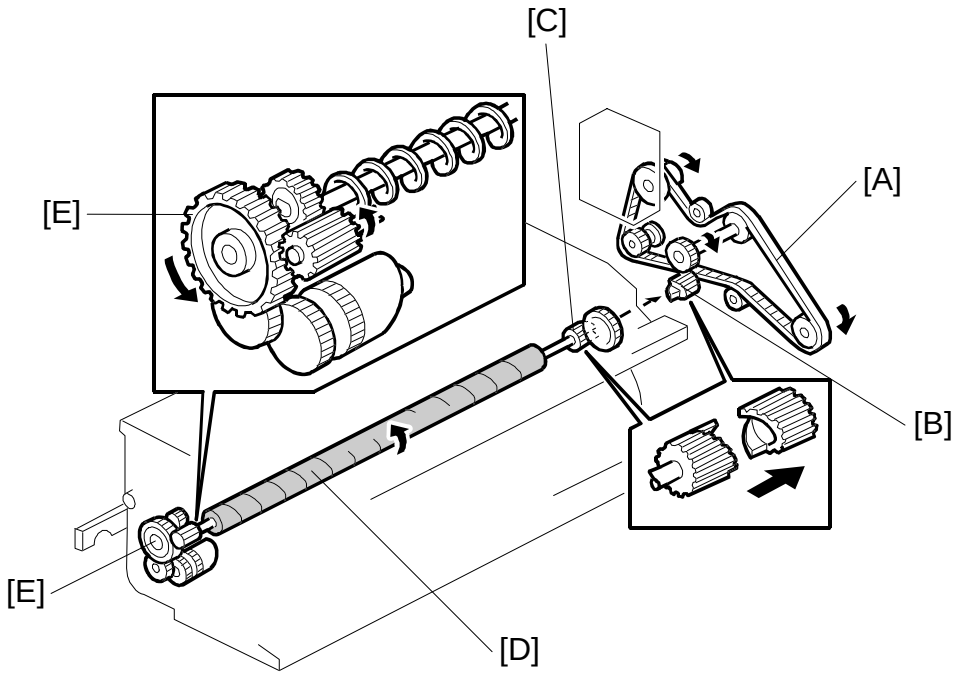
- Causes less wear on the cleaning blade edge.
- Has a high cleaning efficiency.

Due to the high efficiency of this cleaning system, this copier does not use the pre-cleaning corona and cleaning bias.

The cleaning brush [B] supports the cleaning blade.
The brush collects toner from the drum surface and the cleaning blade scrapes the toner off the brush. Toner on the cleaning brush is scraped off by the mylar [C] and falls to the toner collection coil [D]. The toner collection coil transports the toner to the toner recycle unit.

To remove the accumulated toner at the edge of the cleaning blade, the drum reverses about 4 mm at the end of every copy job. The cleaning brush removes the accumulated toner by this action.

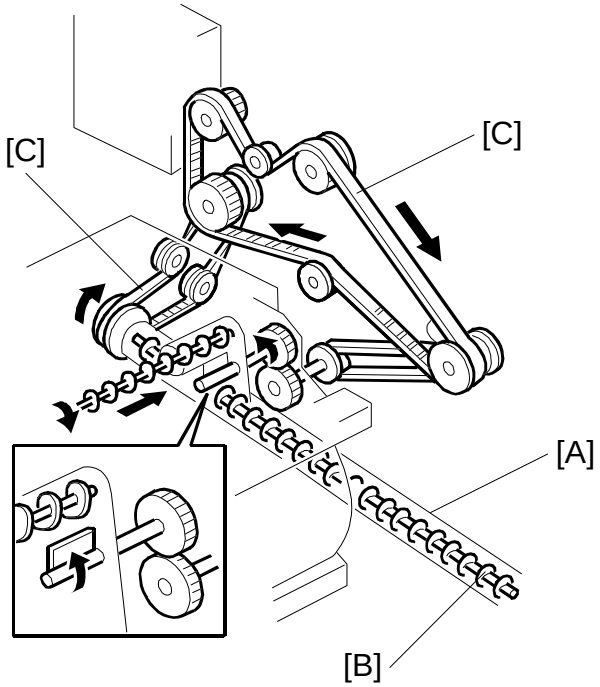
Drive Mechanism



A246D525.WMF

The timing belt [A] and the cleaning unit coupling [B] transmit drive from the drum motor to the cleaning unit drive gear. The cleaning unit drive gear [C] then transmits the drive to the front through the cleaning brush [D]. The gear at the front drives the toner collection coil gear [E].

Toner Collection Mechanism

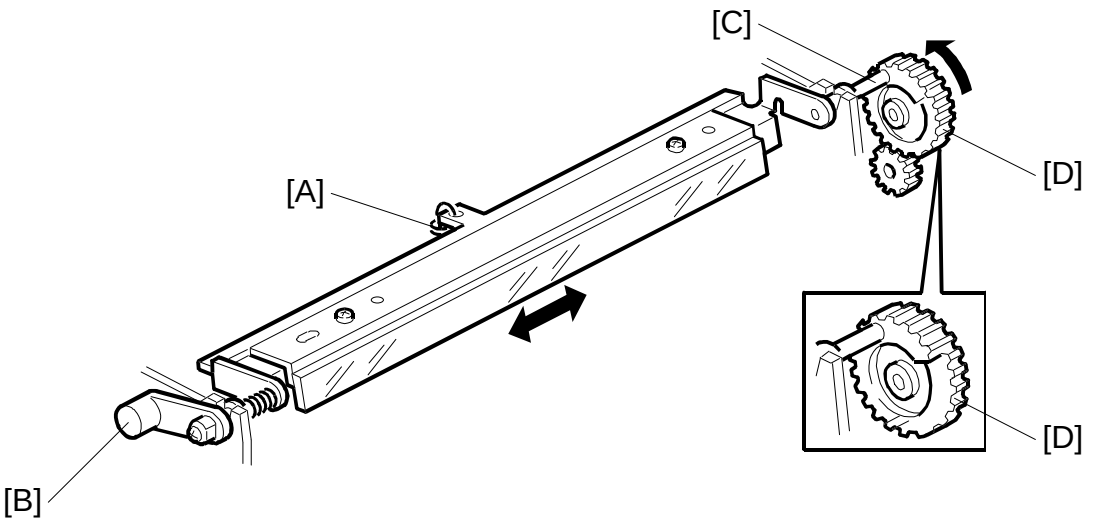


A246D527.WMF

The toner collection tube [A] transports toner collected by the cleaning unit to the toner recycle unit.

Drive belts [C] from the main motor drive the toner transport coil [B].

Cleaning Blade Pressure Mechanism and Side-to Side Movement

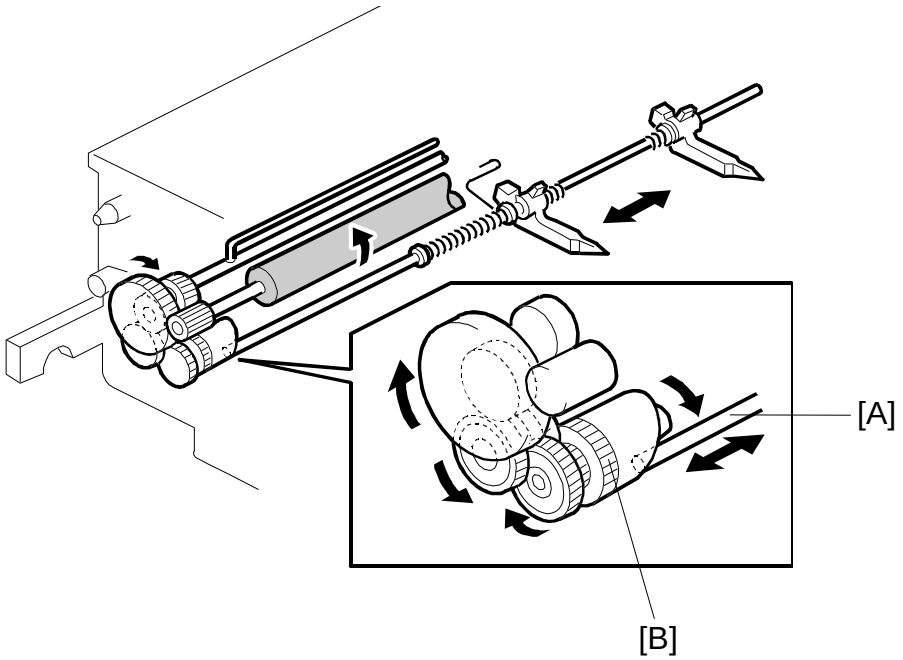


A246D526.WMF

The spring [A] always pushes the cleaning blade against the drum. Pushing up the release lever [B] manually releases the cleaning blade pressure. To prevent cleaning blade deformation during transportation, the release lever must be locked in the pressure release (upper) position.

The pin [C] at the rear end of the cleaning blade holder touches the cam gear [D], which moves the blade from side to side. This movement helps to disperse accumulated toner, preventing early wear of the blade edge.

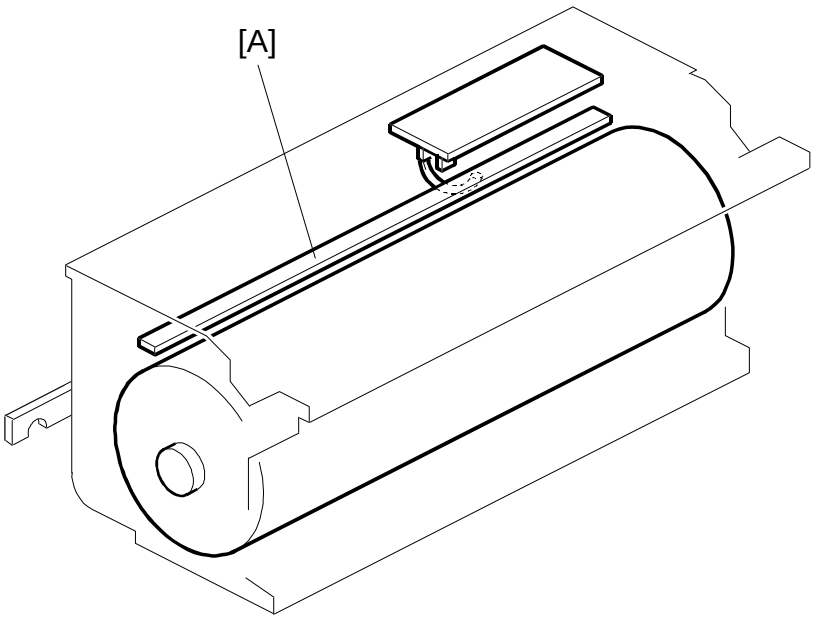
Pick-off Mechanism



A246D528.WMF

The pick-off pawls are always in contact with the drum surface because of weak spring pressure. They move from side to side during the copy cycle to prevent drum wear at any particular location. A shaft [A] and a cam [B] create this movement.

2.2.6 QUENCHING



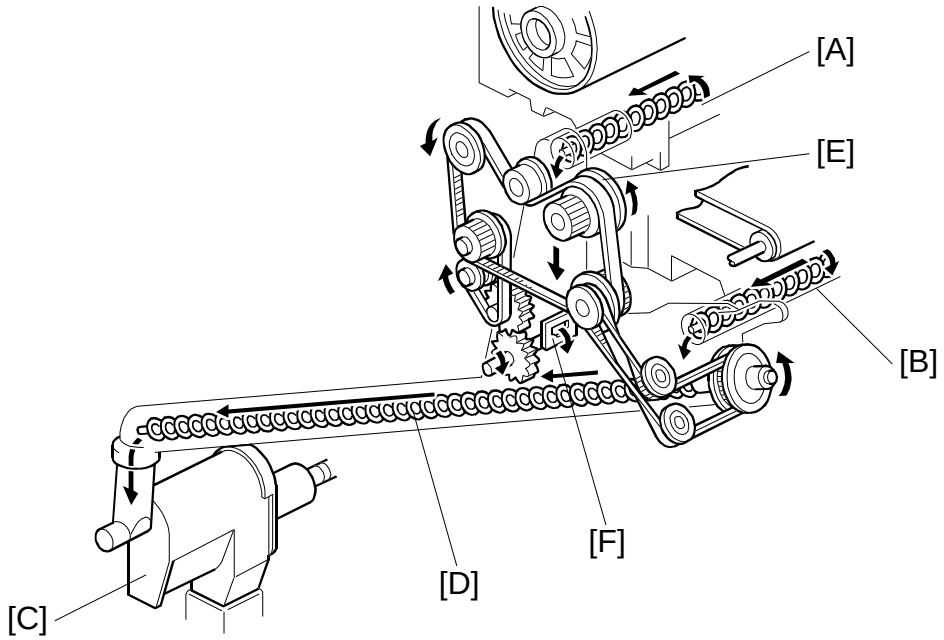
A246D530.WMF

In preparation for the next copy cycle, light from the quenching lamp [A] neutralizes any charge remaining on the drum.

The quenching lamp consists of a line of 16 LEDs extending across the full width of the drum.

2.3 DRUM CLEANING AND TONER-RECYCLING

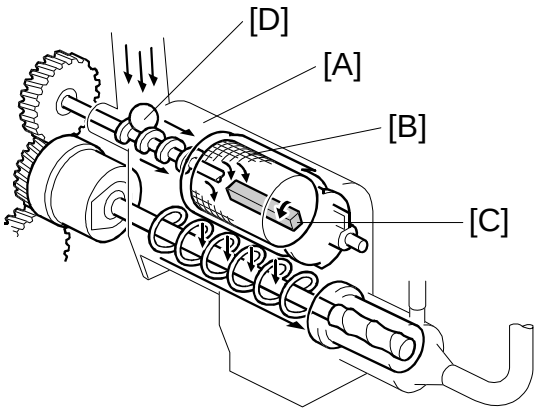
2.3.1 TONER TRANSPORT



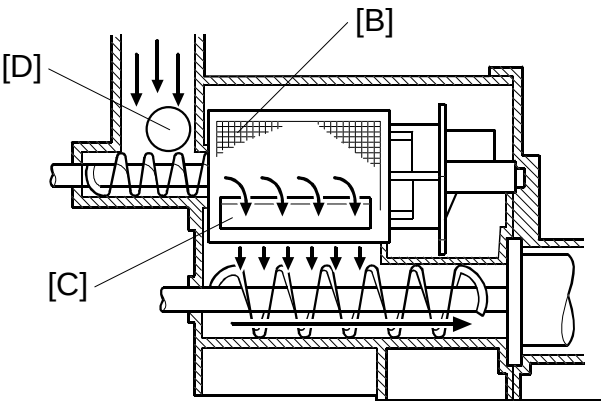
A246D500.WMF

The toner transport tube transports the toner collected by the drum cleaning [A] and transfer belt [B] units to the toner-recycling unit [C]. The toner transport coil [D] transports the toner. The main motor [E], using timing belts, pulleys, and gears, drives the transport coil. To ensure good toner flow, a fin [F] breaks up the toner that drops from the tube of the drum-cleaning unit.

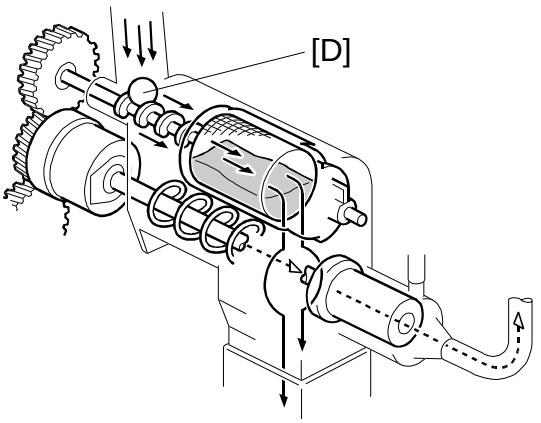
2.3.2 FILTERING



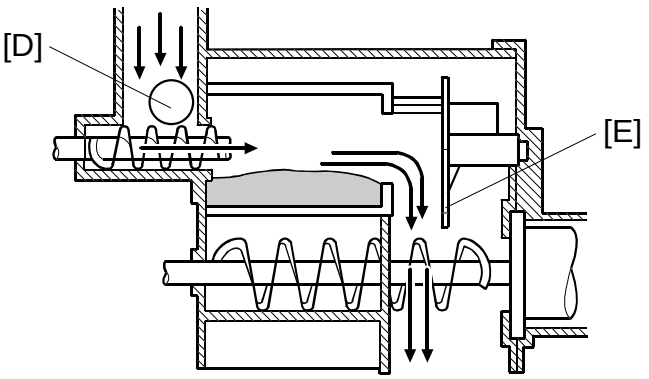
A246D501.WMF



A246D502.WMF



A246D503.WMF

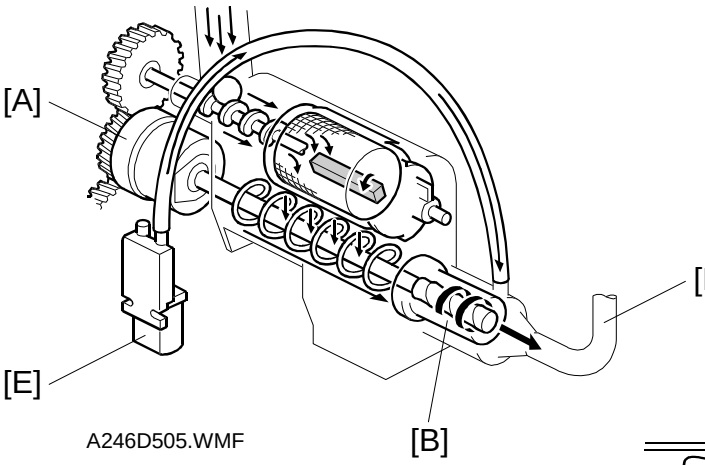


A246D504.WMF

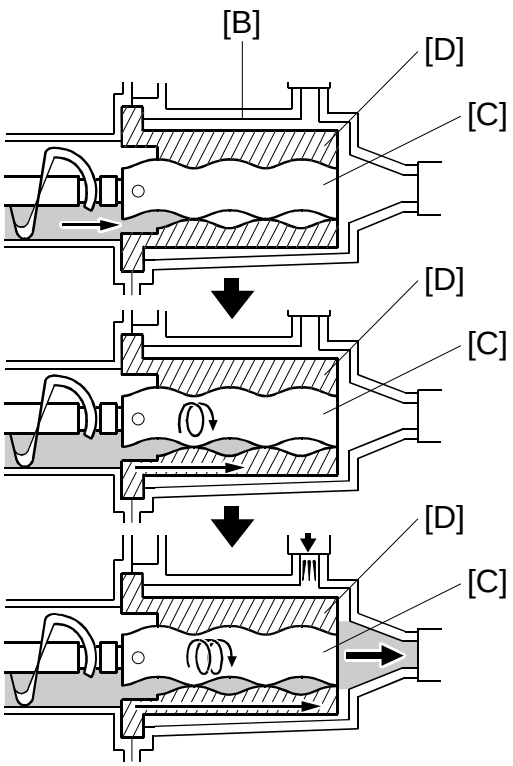
The toner collected by the toner transport coil is delivered to the filtering unit [A]. The filtering unit consists of a mesh filter [B] and agitation bar [C]. The re-usable toner passes through the holes in the mesh filter. The agitation bar in the mesh filter prevents the holes in the mesh filter from being blocked.
When the coil rotates, the ball [D] stays in the groove in the toner exit coil, and prevents the toner from blocking the holes in the mesh filter.

The unusable material (blocked toner and paper dust) does not pass though the holes in the mesh filter. It exits from the mesh filter and drops into the opening [E], which leads to the toner collection bottle.

2.3.3 PUMP MECHANISM



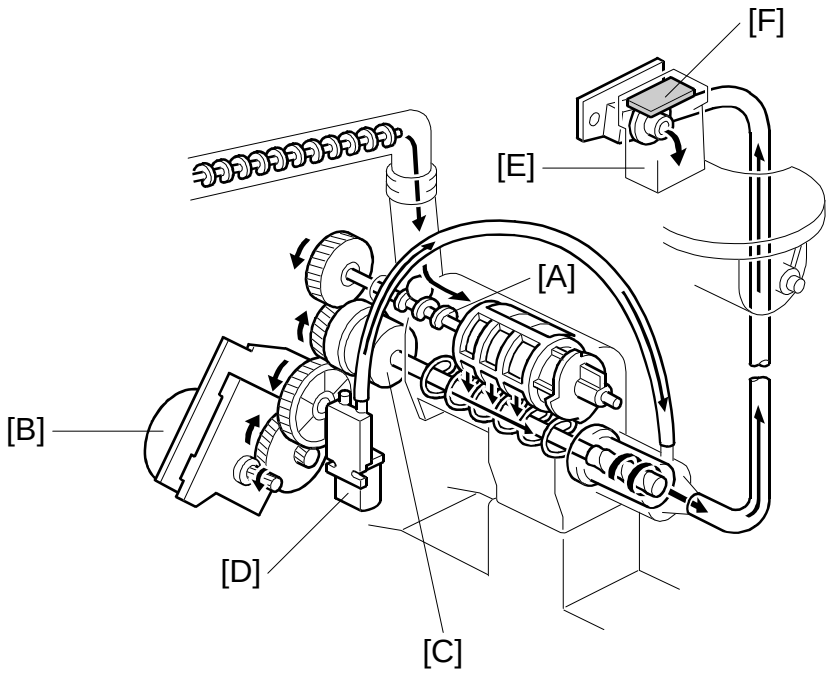
A246D505.WMF



A246D506.WMF

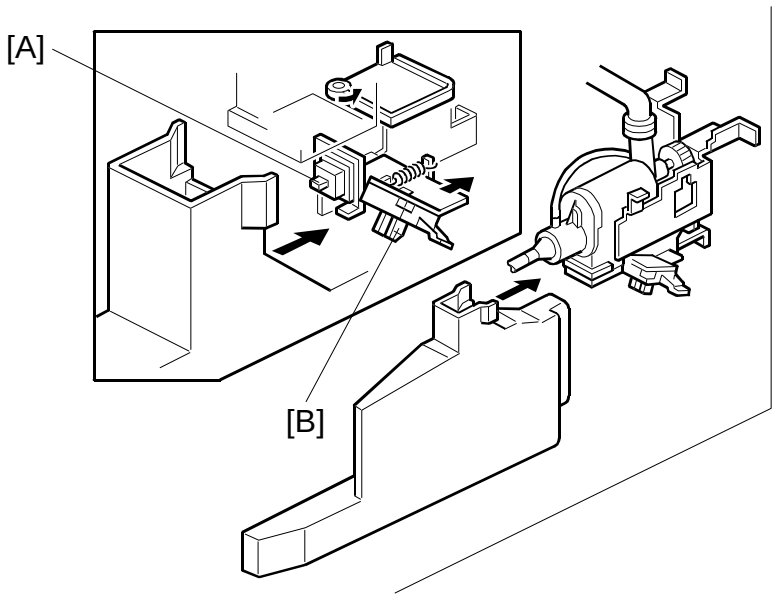
The screw in the toner-recycling unit delivers the re-usable toner to the screw-pump unit [B] when the toner-recycling clutch [A] is activated.
The screw-pump consists of a rotor [C] and stator [D]. The rotor turns inside the stator, and the screw-pump transports the toner as shown. The toner recycle motor [E] pushes air into the screw-pump, blowing the toner from the screw-pump into the development unit ([E] on the next page) through the toner-recycling tube [F].
The toner hopper has two air pressure release filters ([F] on the next page) because of the amount of air sent to the toner hopper. When the toner supply clutch remains on for 9.3 seconds or the copying time reaches 60 seconds, whichever comes first, the toner-recycling clutch turns on for 2 seconds. The air pump motor turns on for 6 seconds at the same time as the toner-recycling clutch.

2.3.4 DRIVE MECHANISM



The toner-collection motor [B] drives the exit coil [A] for the toner using gears. The toner-recycling clutch [C] and gears drive the pump-unit. The toner recycle motor [D] supplies air.
When the toner-collection motor locks, the LCD displays an SC345 (toner-collection motor abnormal) message. If the toner recycle motor disconnects for more than one second, the LCD displays an SC346 (toner recycle motor disconnected) error message.

2.3.5 TONER COLLECTION BOTTLE

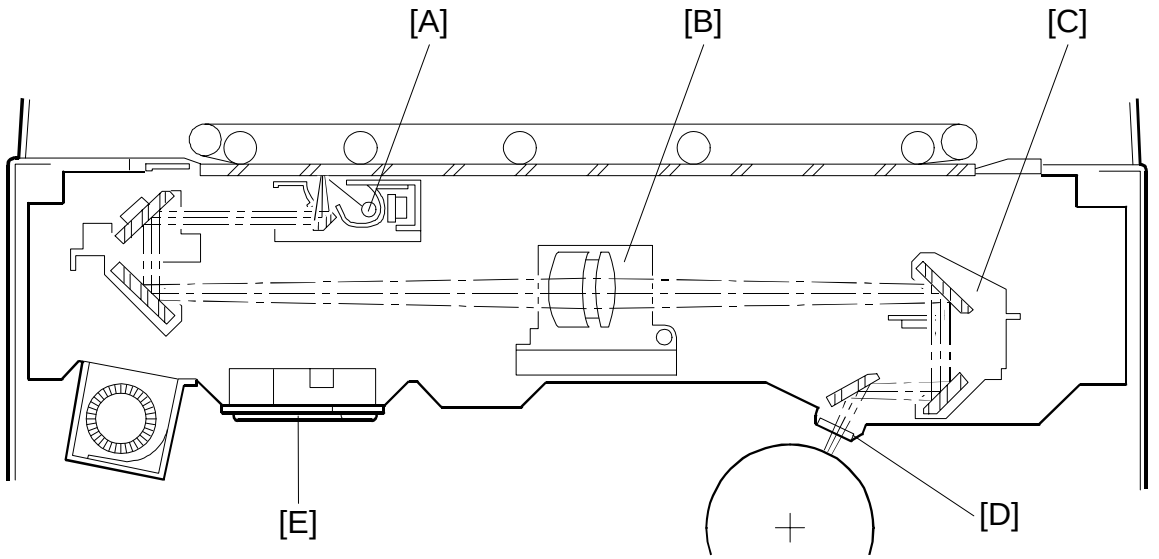


A246D508.WMF

The set switch [A] for the toner collection bottle detects whether it is set properly. The operation panel indicates when the bottle is not set correctly. The toner overflow sensor [B] detects when the toner collection bottle becomes full. In this condition, the copy job can end, or make up to 100 continuous copies. Then copying is disabled and the LCD displays the service call “full toner collection bottle”. De-actuating and then actuating the set switch for the toner collection bottle can clear this condition.

2.4 OPTICS

2.4.1 OVERVIEW



A246D532.WMF

The optics unit reflects an image of the original from the exposure glass onto the OPC drum. This forms a latent electrical image of the original.

This model utilizes a halogen lamp (85 V 200 W: A246 copier, 225 W: others) for the exposure lamp [A]. The lamp surface is frosted to ensure even exposure.

Six mirrors are used to make the optics unit smaller and obtain a wide reproduction range ratio (50 ~ 200%).

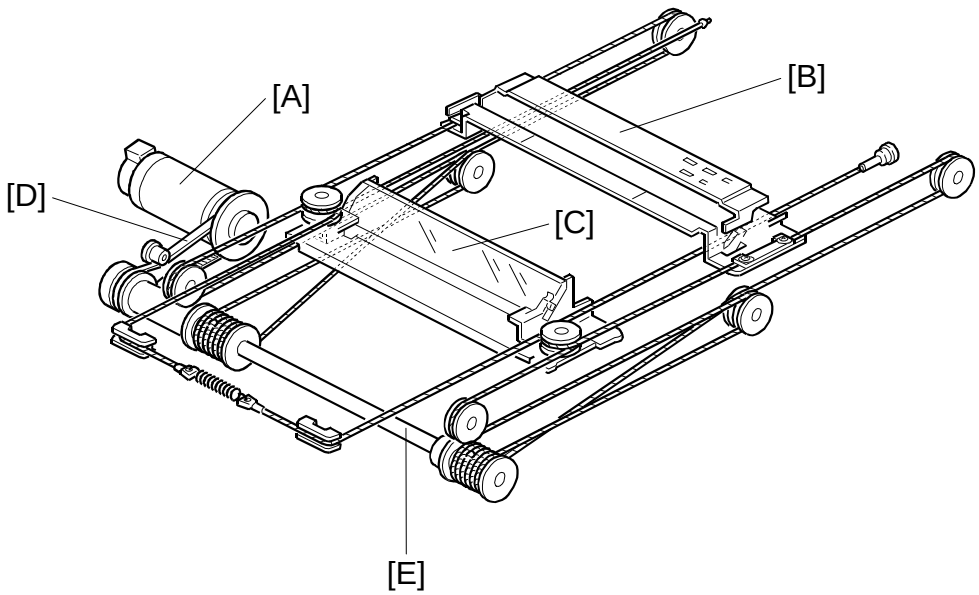
Two stepper motors drive the lens [B] (1) vertically (parallel to the paper feed direction) and (2) horizontally.

A stepper motor changes the position of the third scanner unit [C] (4th and 5th mirrors) to correct the focal length changes during reduction and enlargement modes.

The toner shielding filter [D] is green (a green filter partly absorbs red light) to improve duplication for red originals.

The optic anti-condensation heater [E] (located on the optic base plate) turns on while the main switch is off to prevent moisture from forming on the optical equipment.

2.4.2 SCANNER DRIVE



A246D533.WMF

The scanner drive motor [A] is a DC servomotor. The scanner drive speed is 330 mm/second (50/51-CPM version) or 430 mm/second (other versions) during scanning. When the scanner goes back, scanner drive speed is 1,950 mm/second (50/51, 60-CPM versions). For the 70-CPM version, the scanner drive speed changes in relation to the paper size.

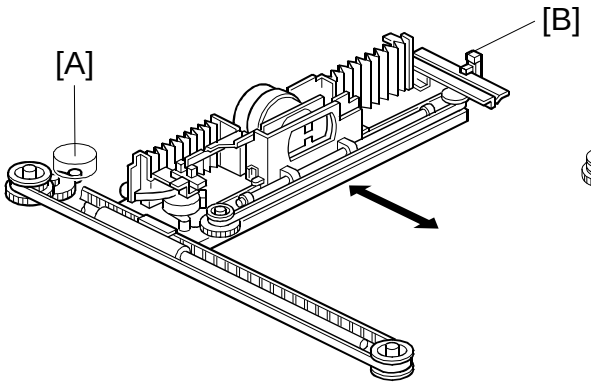
Paper size	A248 copiers scanner return speed (mm/seconds)
DLT ≥ X > B4	1,580
B4 ≥ X > A4 lengthwise	1,650
A4 lengthwise ≥ X > LT sideways	2,000
LT sideways ≥ X > B5 sideways	2,000
B5 sideways ≥ X > A5 sideways	1,900
A5 sideways ≥ X	1,550

X: Paper size

The scanner drive motor drives the first [B] and second scanners [C] using two scanner drive wires via the timing belt [D] and the scanner drive shaft [E]. The second scanner speed is half the speed of the first scanner.

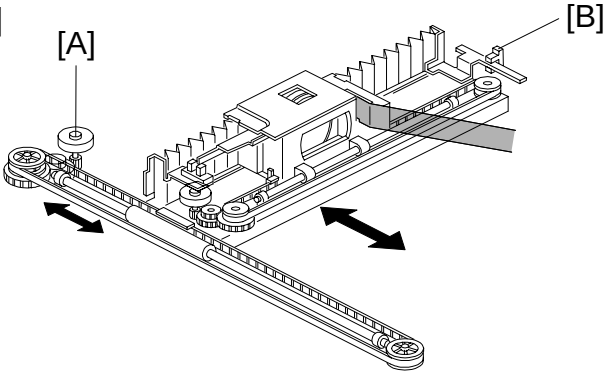
2.4.3 VERTICAL LENS DRIVE

- EU and Asia -

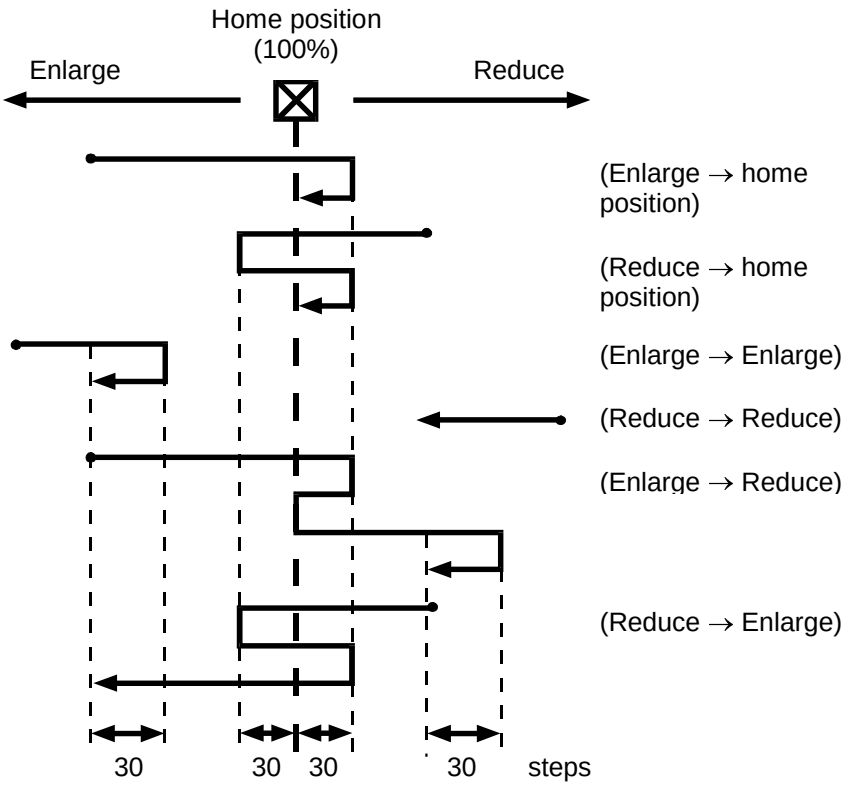


A246D614.WMF

- U.S.A. -



A246D534.WMF



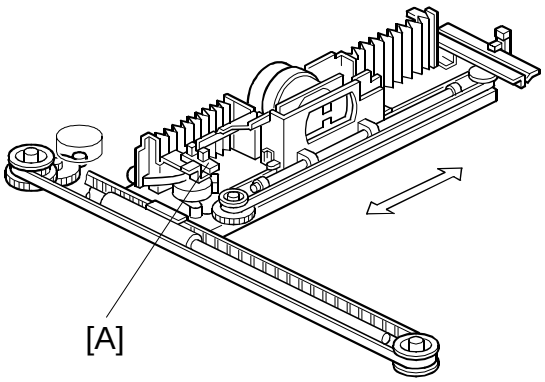
A246D535.WMF

The vertical drive motor [A] for the lens changes its vertical position in accordance with the selected reproduction ratio.

A stepper motor (approx. 0.095 mm/step) shifts the lens using a drive belt. The maximum vertical-shift distance for the lens is 290 mm (from its position at 50% to 200%). The vertical HP sensor [B] detects the vertical position of the lens in full-size mode. The optics control PCB keeps track of its position by the number of pulses sent to the vertical drive motor.

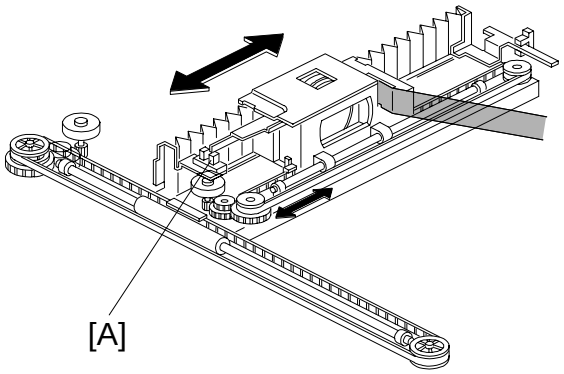
2.4.4 HORIZONTAL LENS DRIVE

- EU and Asia -

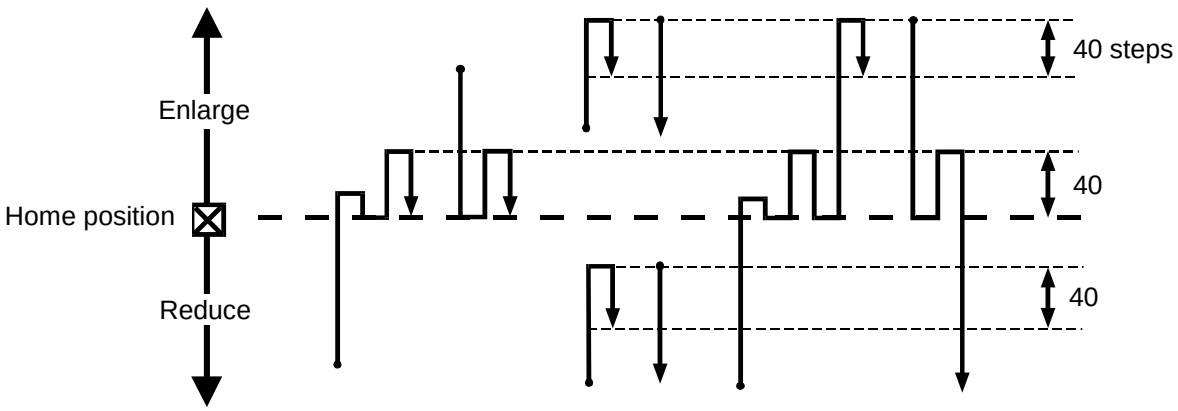


A246D615.WMF

- U.S.A.-



A246D536.WMF



A246D537.WMF

The original horizontal position on the exposure glass varies depending on the mode (such as platen or DJF modes) to make it easier to handle the original. However, the central paper feed is the standard position for paper.

Therefore, the horizontal position of the lens must change according to the paper size, reproduction ratio and original feed and edit modes (centering, margin adjust, etc.).

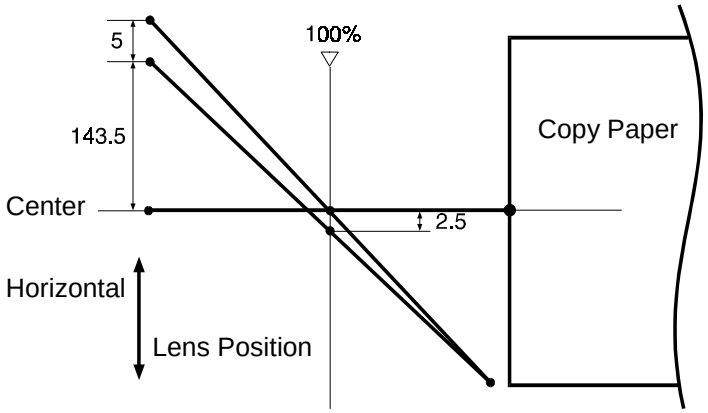
A stepper motor (approx. 0.07 mm/step) moves the lens using the drive belt. The horizontal HP sensor [A] for the lens detects its horizontal position for A4/LT sideways original, in full-size and platen modes.

The other positions are determined by counting the number of motor drive pulses.

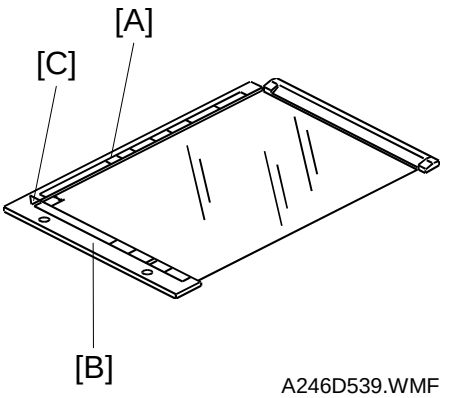
Since this model has a horizontal lens drive mechanism, side-to-side registration adjustment for each feed station can be done easily using an SP mode (SP1-1-1 Side to Side Registration Adj.).

2.4.5 HORIZONTAL LENS POSITIONING

For Original Position



A246D538.WMF



A246D539.WMF

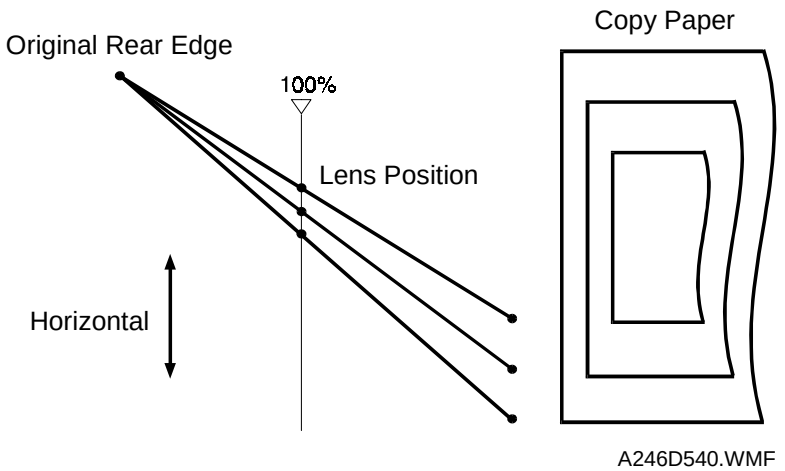
There are two standard positions for the original in platen and DJF modes.

In platen mode, the original aligns with both the rear [A] and the left [B] original alignment scales (rear left corner [C] is the standard position).

In DJF mode, the original position is 5 mm in front of the platen-mode original position to maintain the original transport path (5 mm from the rear scale).

The above figure shows the horizontal lens positions in each mode when using one paper size.

For Paper Size



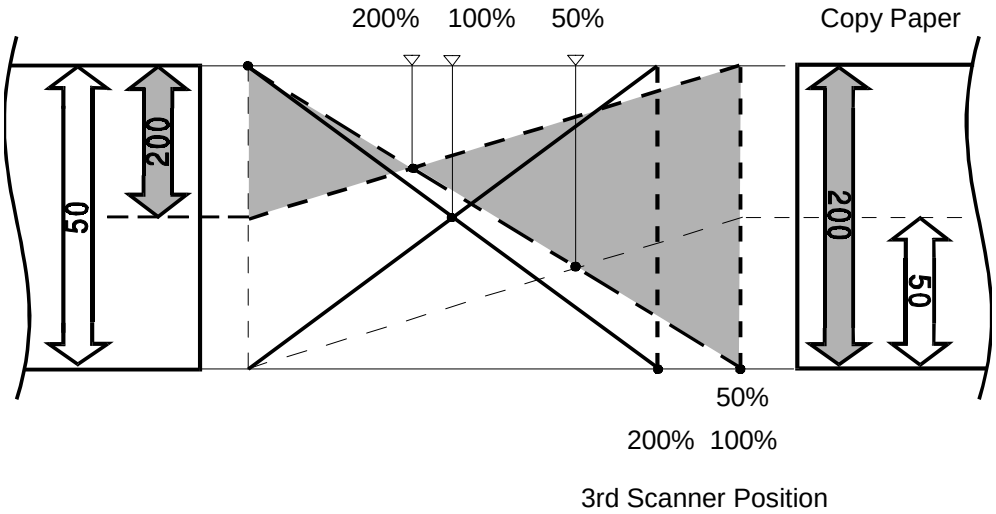
A246D540.WMF

To maintain high paper feed performance, the central paper feed is the standard position for paper. Consequently, the horizontal lens position changes according to the paper size.

The figure shows the lens horizontal position for each paper size in full-size mode.

For Reproduction Ratio

<*Original Rear Edge*>

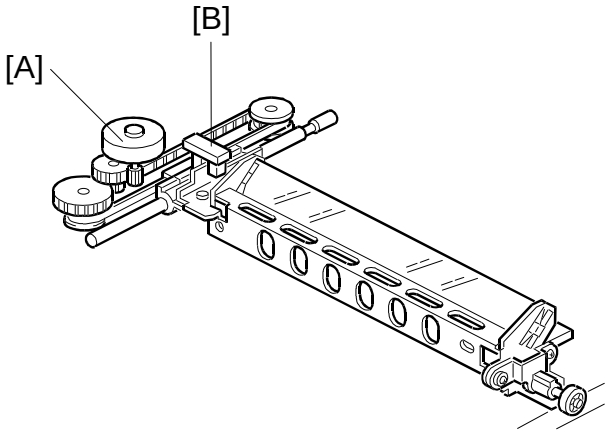


A246D541.WMF

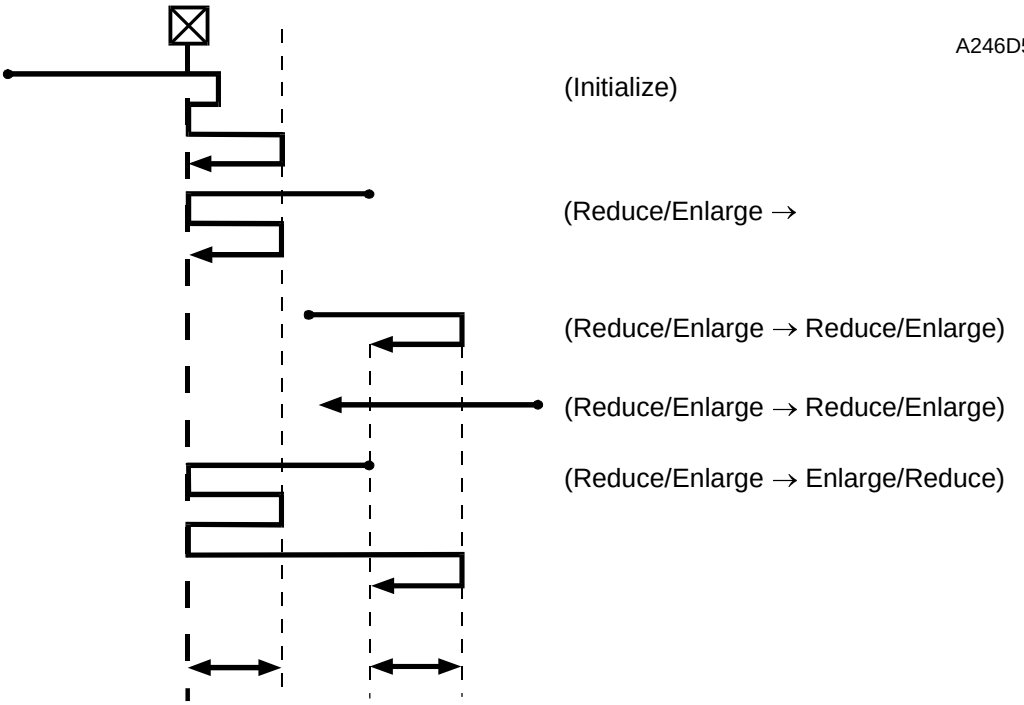
When the reproduction ratio changes, so does the vertical position of the lens. At the same time, the total focal length must shift to adjust the focus of the image. To change the focal length, the vertical position of the 3rd scanner adjusts to a maximum distance of 50 mm (from its position at 100% to the position at 50 or 200%).

The figure shows the lens horizontal position at 50, 100 and 200%.

2.4.6 3RD SCANNER DRIVE



A246D542.WMF



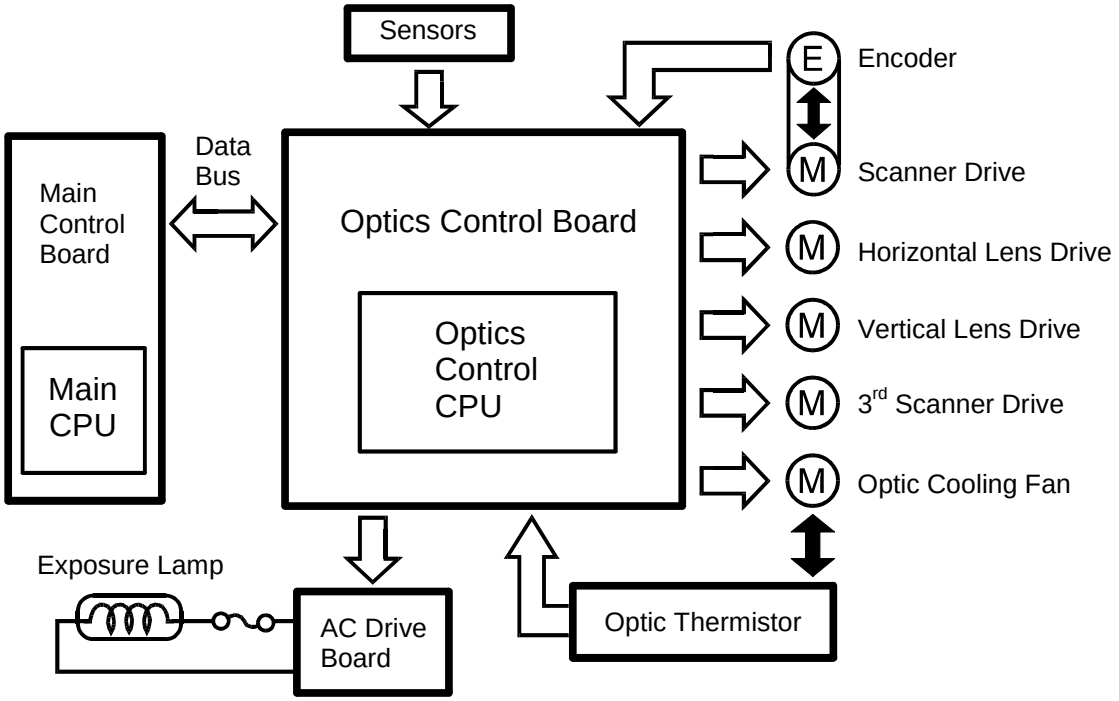
A246D543.WMF

For the focus to compensate for reproduction and lens position changes, the 3rd scanner (4th and 5th mirrors) position is changed.

The 3rd scanner drive uses a stepper motor [A] (approx. 0.095 mm/step).

The 3rd scanner HP sensor [B] detects the unit position for full-size mode. The optics control PCB keeps track of the unit position from the number of motor drive pulses.

2.4.7 OPTICS CONTROL CIRCUIT



The optics control board communicates with the main board through a data bus. It monitors all the sensor signals, encoder and thermistor output and controls all the motors for optics.

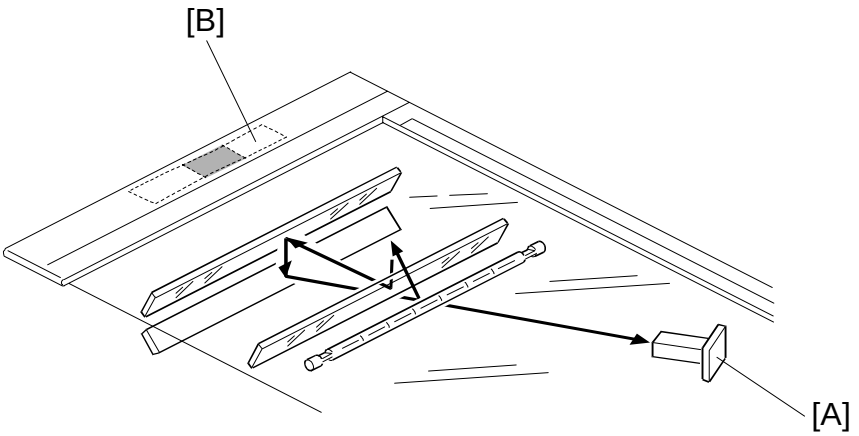
At the programmed time, the main CPU sends a scanner start signal to the optics control CPU.

The CPU generates a pulse-width modulation (PWM) signal. The PWM signal goes to a driver circuit, which sends drive pulses to the scanner drive motor.

An encoder in the scanner drive motor generates pulse signals. A speed/direction control circuit monitors the scanner speed and the direction of the signals, and uses this data to regulate the motor speed.

The HP sensor monitors the position of the scanner. After turning on the copier, the main CPU confirms the scanner position by moving the scanner out of the home position and back again. This data is sent to the optics control CPU.

2.4.8 AUTOMATIC IMAGE DENSITY CONTROL SYSTEM (ADS)

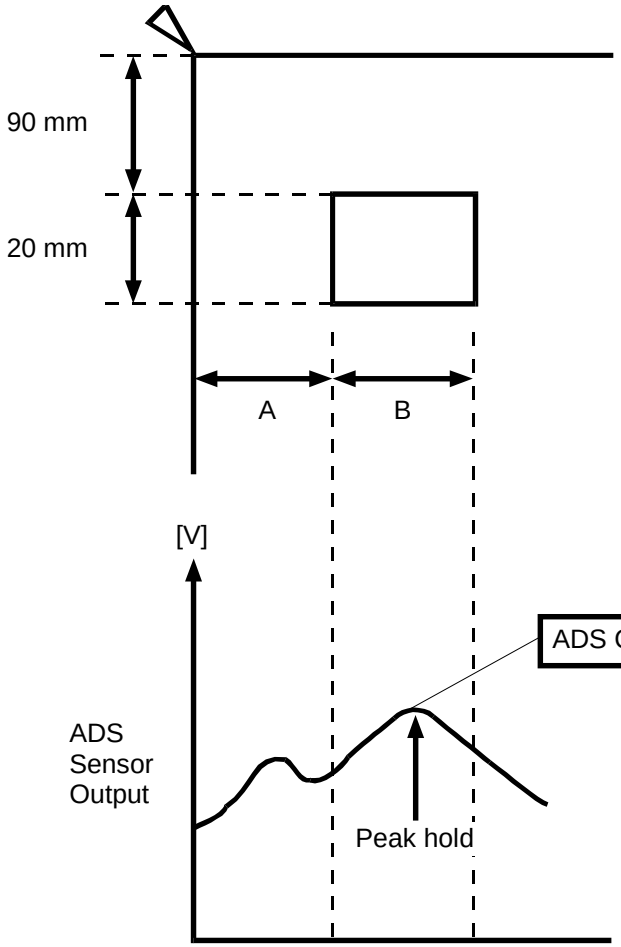


A246D545.WMF

In ADS mode, the ADS sensor [A] detects the density of the original background [A]. The main CPU determines an appropriate development bias voltage for the original to prevent dirty backgrounds from appearing on copies.

The ADS sensor board is on the rear side of the optics side plate. The sensor housing cover, which has a small hole to direct the reflected light from the original to the ADS sensor, covers the sensor board.

The machine adjusts the ADS sensor standard voltage to 2.7 V when process control data initialization is performed. The exposure lamp turns on with ID level 4 at the home position and the light reflected by the ADS pattern [B] (white painted) reaches the ADS sensor. The main CPU adjusts the ADS gain data automatically to make the output 2.7 V. The RAM board stores this data.



$$A = \frac{9.7}{M} (mm)$$

$M = 1.0 \quad (m = 50 \sim 100)$

$$M = \frac{m}{100} (m = 101 \sim 200)$$

$$B = \frac{8.25}{m} x100 \ (mm)$$

m: reproduction ratio
(50 ~ 200)

A246D546.WMF

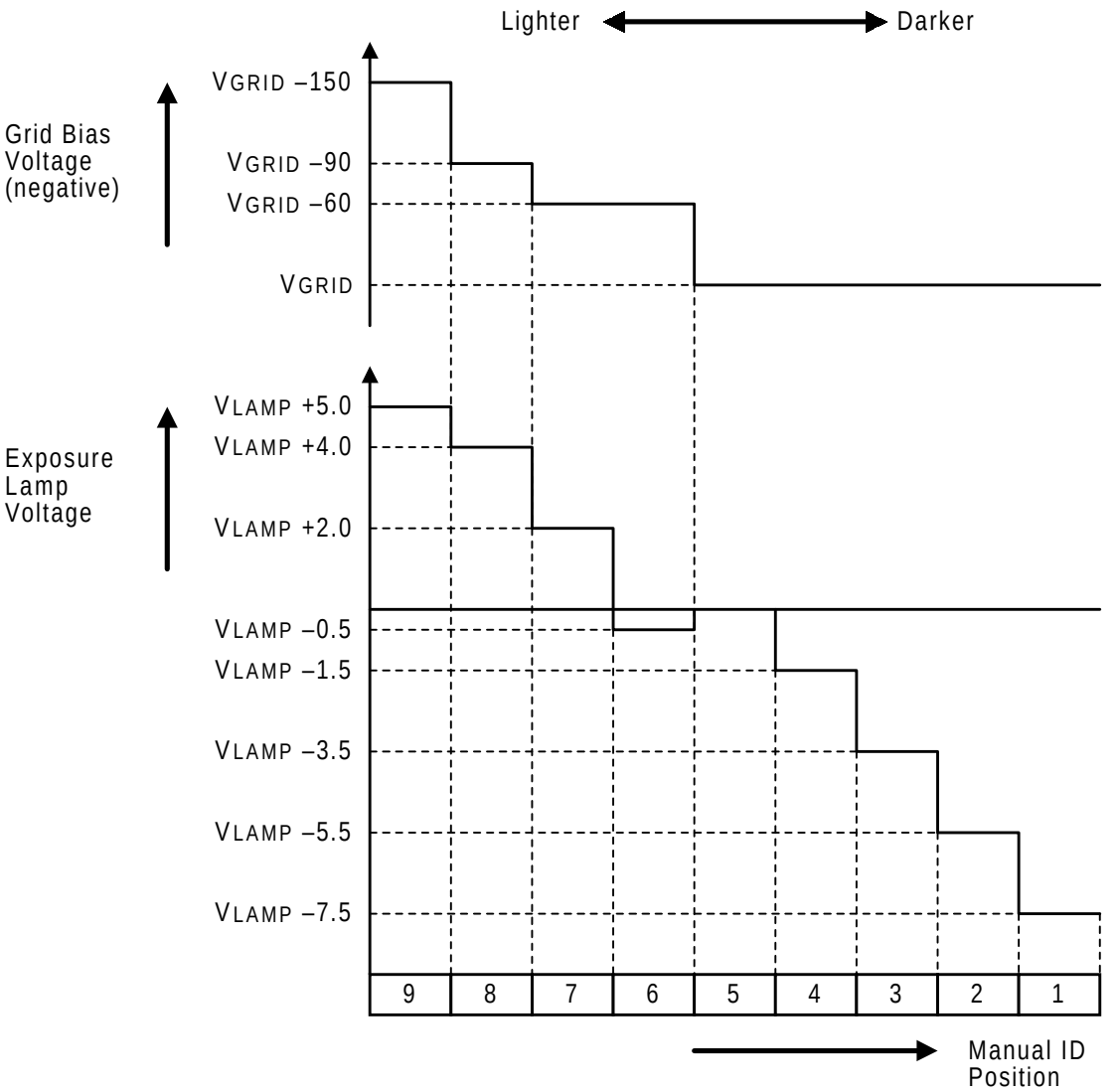
For the first scanning of an original in ADS mode, the CPU starts sampling the ADS sensor output while exposing the ADS pattern at the scanner home position. Then the CPU stores the maximum ADS sensor output as a reference voltage. This means that during every ADS check cycle the ADS reference voltage is renewed. It is renewed by the latest exposure light reflected from the ADS pattern when the original is first scanned.

In the full-size mode, the CPU takes samples from the ADS sensor output when the scanner scans the original from 9.7 mm to 18 mm from the left scale edge. The CPU takes the maximum ADS sensor output during the sampling period and compares it with the ADS reference voltage to determine the correct development-bias voltage. (See development bias control section for details.)

The sampling length of ADS sensor output for the original differs depending on the reproduction ratio because scanner speed differs.

2.4.9 MANUAL IMAGE DENSITY CONTROL

When the image density is set manually, the voltage applied to the exposure lamp changes as shown in the table below.

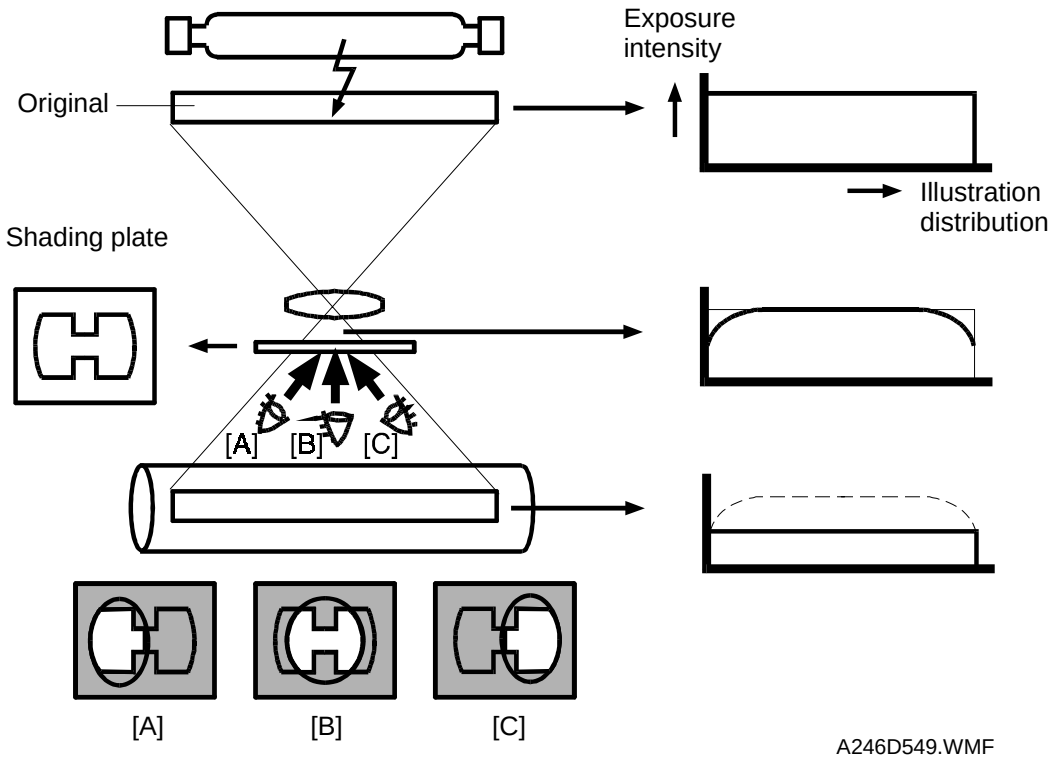


A246D547.WMF

VLAMP: Exposure lamp voltage at ID level 5.
The initial setting for the process control data determines this value.

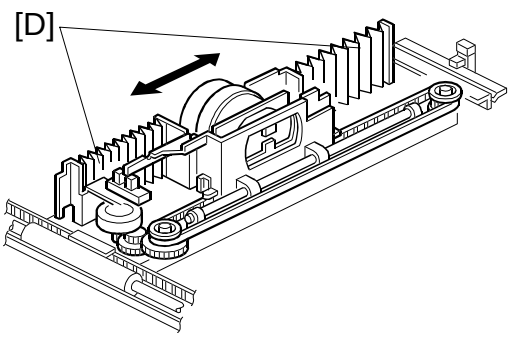
VGRID: Grid bias (negative) voltage at ID level 5.
This value is determined at the initial setting of the process control data.

2.4.10 UNEVEN LIGHT INTENSITY CORRECTION



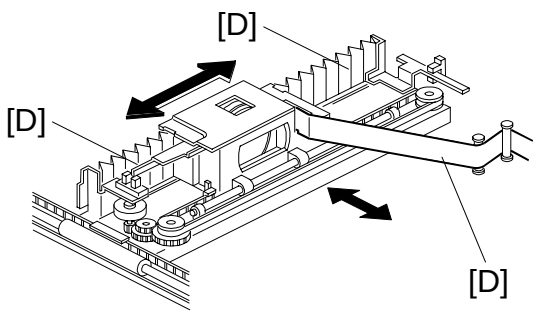
A246D549.WMF

- EU and Asia -



A246D662.WMF

- U.S.A. -



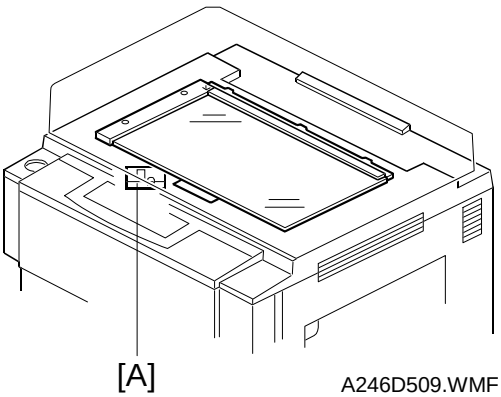
A246D548.WMF

The entire surface of the exposure lamp is frosted to ensure even exposure.

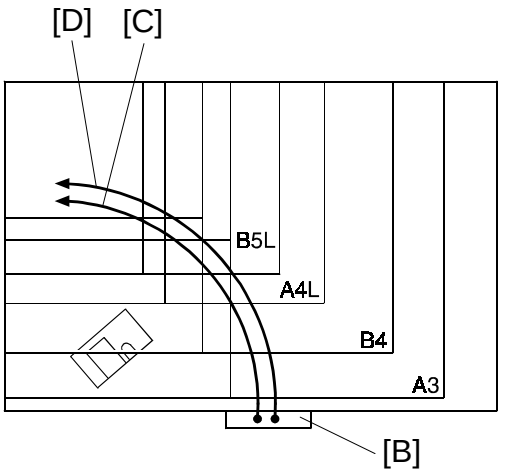
A shading plate in front of the lens compensates for the reduced light at the edge of the lens. The shading plate is fixed to the lens unit.
The shading plate compensates for the light intensity when the horizontal lens position shifts (from [A] to [C]).

Also, the shading mylars [D] intercept any diffused reflected light from outside the light path.

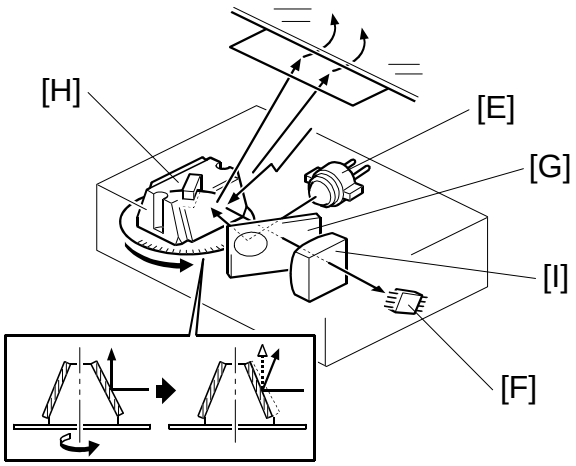
2.4.11 ORIGINAL SIZE DETECTION IN PLATEN MODE



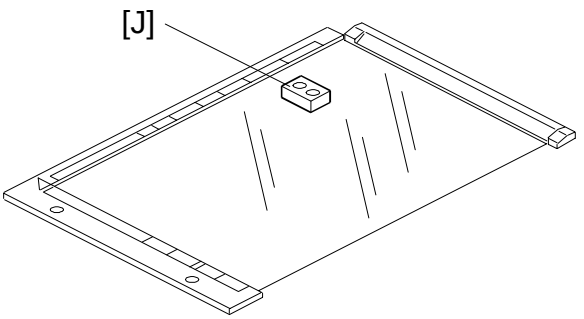
A246D509.WMF



A246D511.WMF



A246D510.WMF



A246D669.WMF

The APS sensor [A] in the optics cavity detects the size of the original by scanning it on the exposure glass.

The APS sensor emits two beams of light onto the exposure glass. The APS sensor receives the reflected light from the exposure glass. The machine measures the period from when the APS sensor detects the start plate [B] until it detects the original. It does this for each beam. When the period for beam 1 [C] is longer than for beam 2 [D], the original is lengthwise. Otherwise, it is sideways. The results from beam 1 determine the size of the original.

The beam from the LED [E] goes to the partially reflecting mirror [G]. This mirror sends the beam to the spinning mirror [H], then to the exposure glass. The exposure glass reflects the image back to the spinning mirror [H], which sends it to the lens [I] and finally it reaches the light receiving element [F]. The rotating the spinning mirror creates beam arcs. The spinning mirror has two mirrors at different angles to emit two beams every rotation. SP mode 2-3-2 displays the size detected by the APS sensor. SP modes 2-3-3 and 2-3-4 display the pulses and counts detected by APS beam 1 and 2. There is also a reflective sensor [J] in the optics cavity for Inch version copiers. It distinguishes original size LG (8 1/2" x 14") from LT (8 1/2" x 11"), or F (8 1/2" x 13") from LT (8 1/2" x 11").

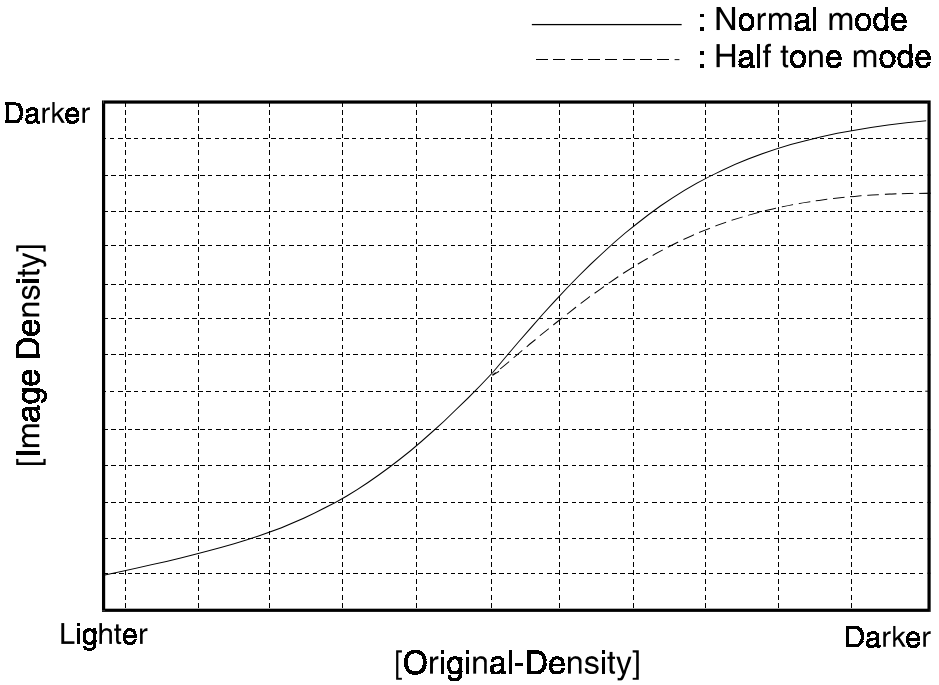
	Beam 1 standard	Beam 2 standard	Beam 1 tolerance (Metric ver.)	Beam 1 tolerance (Inch ver.)
A3	505	518	110	—
11" x 7"	845	843	—	77
8 k	1,079	1,067	89	—
B4	1,280	1,258	71	—
10" x 14"	1,341	1,317	—	122
8 1/2" x 11"	2,161	2,096	57	standard
A4L	2,300	2,227	standard	—
8" x 10"	2,466	2,384	—	144
16 k-L	2,661	2,567	99	—
B5L	2,993	2,878	156	—
A5L	3,983	3,792	194	—
5 1/2" x 8 1/2"	4,254	4,037	—	208
B6L	4,709	4,438	240	—
A6L	5,940	5,411	438	—
11" x 8 1/2"	845	1,669	77	116
A4S	1,490	2,031	473	—
16 k-S	2,388	2,713	243	—
B5S	2,936	3,184	195	—
A5S	4,028	4,174	170	—
8 1/2" x 5 1/2"	4,246	4,376	—	162
B6S	4,554	4,664	150	—
A6S	5,097	5,411	134	—

L: Lengthwise S: Sideways

NOTE: 8 1/2" x 13" and 8 1/2" x 14" tolerance values are the same as 8 1/2" x 11".

Check the APS sensor condition using the above table. The tolerance is the standard after APS size calibration (SP1-10-1). After APS size calibration and the correct placement of the original on the exposure glass, if the data from beam 1 is not within the tolerance, the APS sensor is deemed defective.

2.4.12 HALF TONE MODE

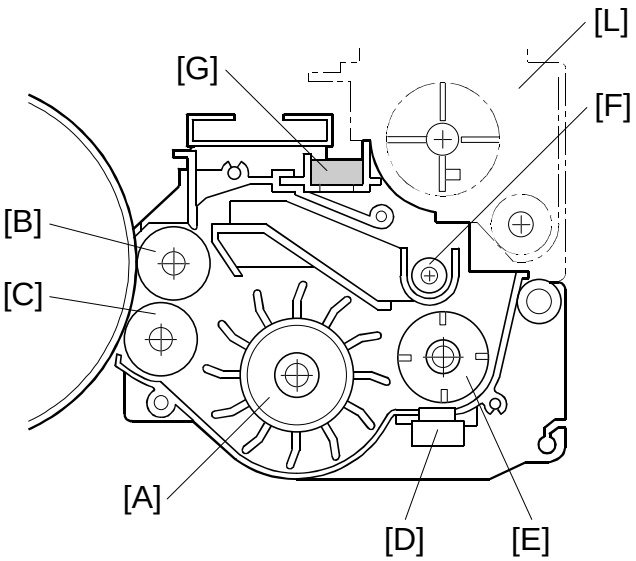


A246D553.WMF

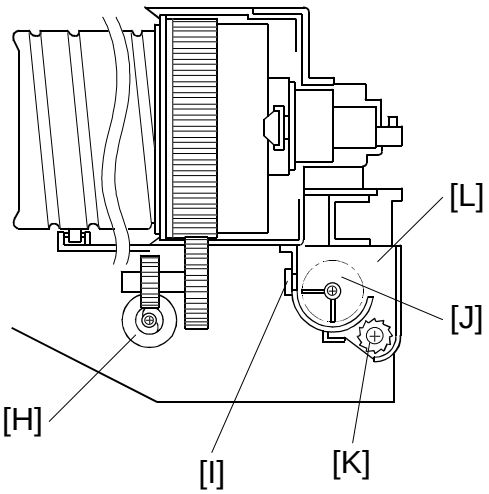
This machine has a half-tone mode. In this mode, selected in the operation panel, the grid voltage for the charge corona is decreased by 200 V. However, this voltage may blank out low-density areas of the original. Decreasing the exposure lamp voltage by 3V corrects this problem. Consequently, this process lowers the image density for picture and half-tone originals.

2.5 DEVELOPMENT

2.5.1 OVERVIEW



A246D622.WMF



A246D640.WMF

- Paddle Roller [A]
- Upper Development Roller [B]
- Lower Development Roller [C]
- Toner Density Sensor [D]
- Developer Agitator [E]
- Toner Auger [F]
- Development Filter [G]
- Toner Supply Motor [H]
- Toner End Sensor [I]
- Toner Agitator [J]
- Toner Supply Roller [K]
- Toner Hopper [L]

This copier uses a double roller development (DRD) system. Each roller has a diameter of 20 mm.

This system differs from single roller development systems in that:

(1) It develops the image in a narrower area

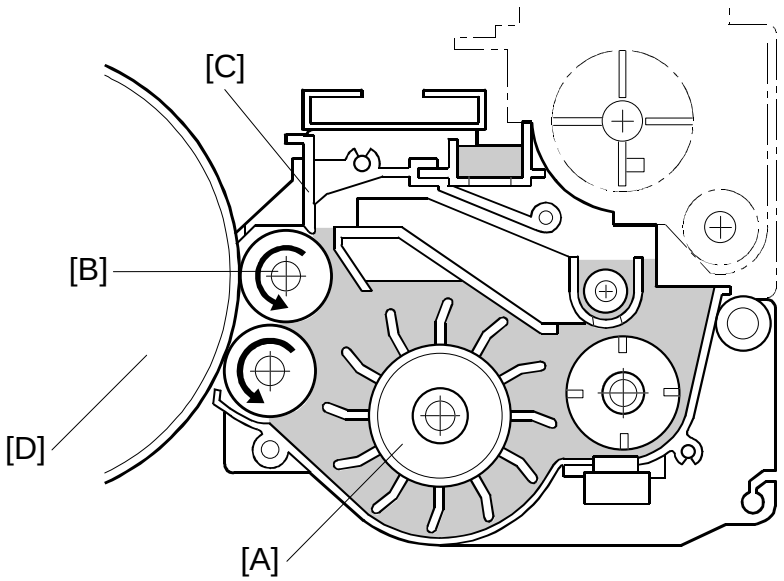
(2) It develops the image twice

(3) There is a reduction in the relative speed for each development roller touching the drum

In addition, this machine uses fine toner (about 7.5 μm) and developer (about 70 μm). Both the DRD system and the new consumables (developer and toner) improve the image quality, especially of thin horizontal lines, the trailing edges of the half-tone areas, and black cross points.

The machine contains a toner-recycling system. The toner-recycling motor carries the recycled toner to the toner hopper [L] and mixes it with new toner using the toner agitator [J]. (The “Drum Cleaning and Toner-recycling section” describes the toner-recycling system.)

2.5.2 DEVELOPMENT MECHANISM



A246D643.WMF

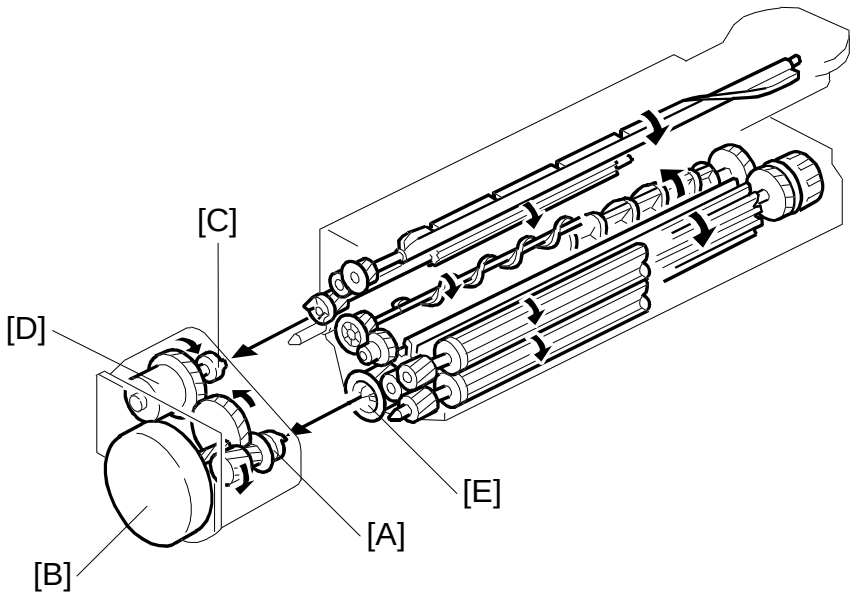
The paddle roller [A] picks up developer and transports it to the upper-development roller [B]. Internal permanent magnets in the development rollers attract the developer to the development roller sleeve. The upper development roller carries the developer past the doctor blade [C]. The doctor blade trims the developer to the desired thickness and creates backspill for the cross-mixing mechanism.

The development rollers continue to turn, carrying the developer to the OPC drum [D]. When the developer brush comes in contact with the drum surface, the negatively charged areas of the drum surface attract and hold the positively charged toner. In this way, the latent image is developed.

The development roller has a negative bias to prevent the toner from attracting to the non-image areas on the drum surface that may have a slight residual negative charge.

After turning another 100 degrees, the developer returns to the paddle roller [A].

2.5.3 DRIVE MECHANISM



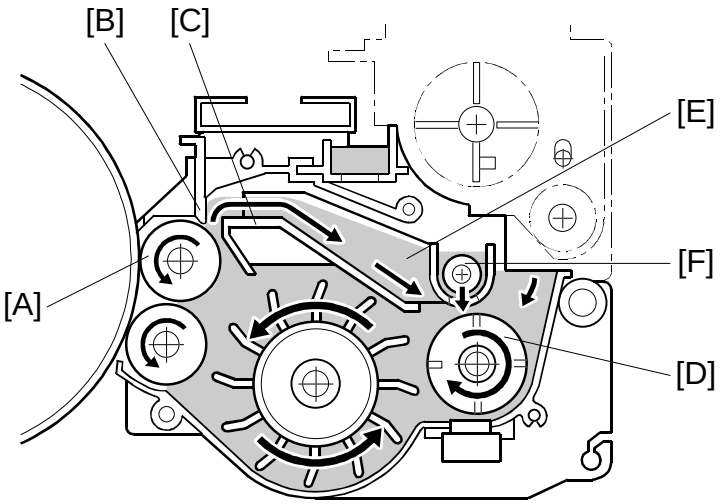
A246D555.WMF

The development drive gear [A] drives the gears of the development unit when the development motor [B] (a DC servomotor) turns.

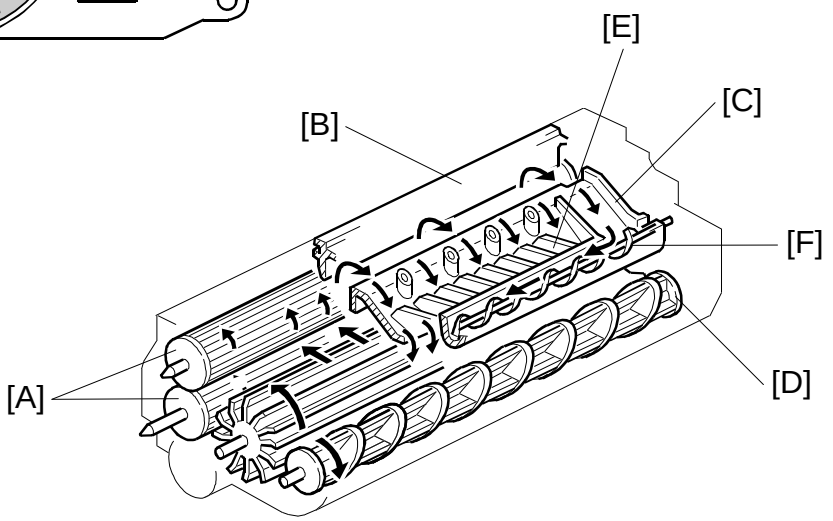
The drive gear [C] for the toner supply roller drives the gears of the toner hopper when the toner supply clutch [D] activates.

The above gears are helical gears. Helical gears are quieter than normal gears. The teeth of the development drive gear are chamfered, beveled symmetrically, so that they smoothly engage the development roller gear [E] during installation.

2.5.4 CROSSMIXING



A246D556.WMF



A246D557.WMF

This copier uses a standard cross-mixing mechanism to keep the toner and developer evenly mixed. It also helps agitate the developer to prevent developer clumps from forming and helps create the triboelectric charge, an electric charge generated by friction.

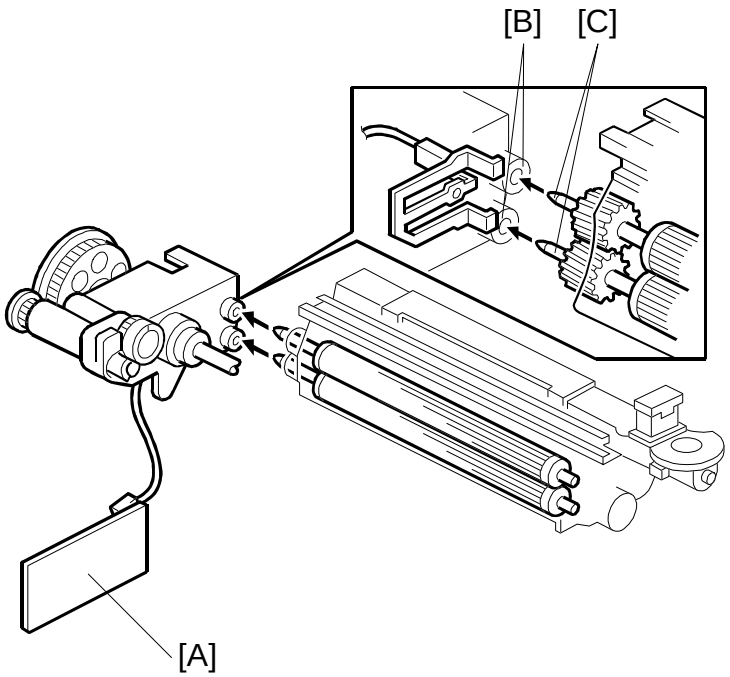
The developer on the turning development rollers [A] is split into two parts by the doctor blade [B]. The part that stays on the development rollers forms the magnetic brush and develops the latent image on the drum. The part that the doctor blade trims off goes to the backspill plate [C].

As the developer slides down the backspill plate to the agitator [D], the mixing vanes [E] move it slightly toward the rear of the unit. Part of the developer falls into the auger inlet and the auger [F] transmits it to the front of the unit.

The agitator moves the developer slightly to the front as it turns, so the developer stays level in the development unit.

2.5.5 DEVELOPMENT BIAS

Overview



A246D558.WMF

The high voltage control Board [A] applies the negative development bias to both the lower sleeve roller and upper sleeve roller through the receptacles [B] and the sleeve roller shaft [C].

The development bias prevents toner from attracting to the background of the non-image area on the OPC drum where there is residual voltage. In addition, the development bias adjusts image density according to the conditions the customer selected.

Bias Control In Copy Cycle

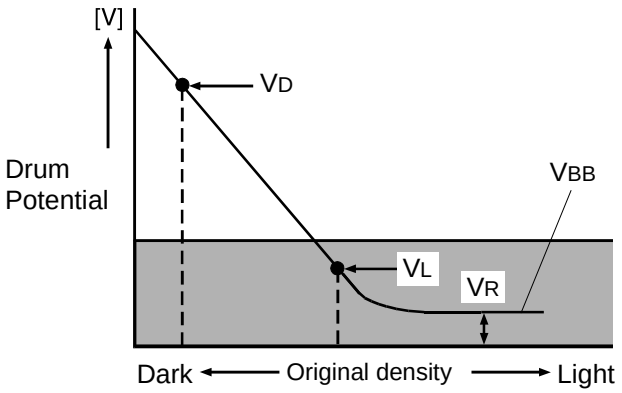
Five factors determine the bias output:

The total bias is:

ADS Mode: $V_B = V_{BB} + V_{BU} + V_{BMG} + V_{BA}$
Manual ID Mode: $V_B = V_{BB} + V_{BU} + V_{BMG}$

V_B: Total bias
V_{BB}: Base bias
V_{BA}: ADS Compensation
V_{BU}: User Tool mode ID Selection Compensation
V_{BMG}: Magnification Compensation

1) Base Bias (V_{BB})

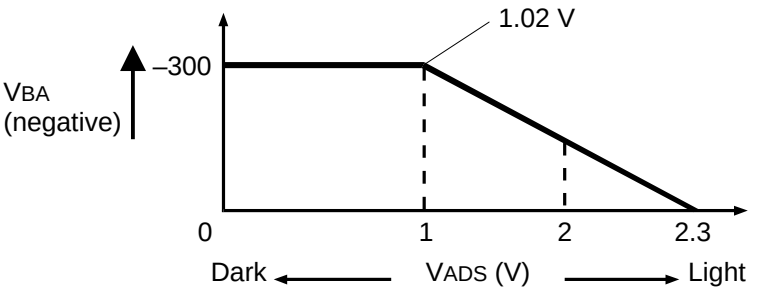


A246D559.WMF

As explained in the process control section, the residual voltage (VR) measured during process control data initialization determines the base bias for development.

$V_{BB} = V_R + (-220)$

2) ADS Compensation (V_{BA})



A246D560.WMF

According to the original background density, the bias is compensated. The compensation value is determined with the voltage measured by the ADS sensor (ADS sensor output: V_{ADS}) as follows:

$V_{BA} = 234 \times (V_{ADS} - 2.3)$

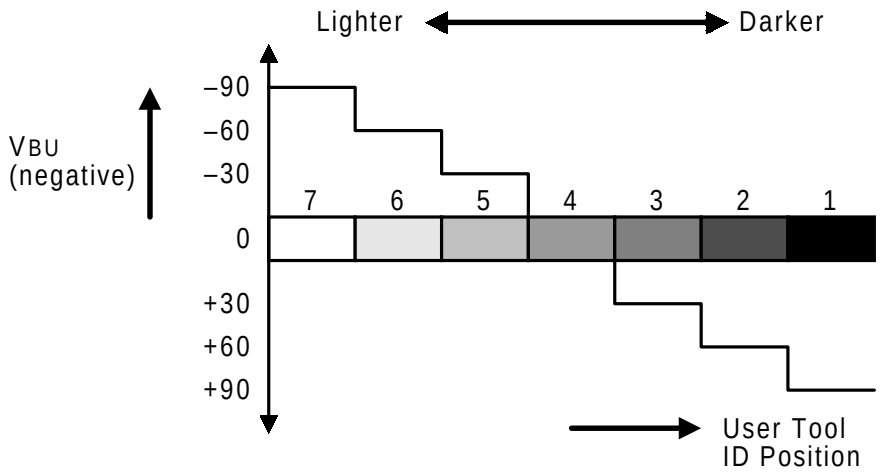
NOTE: V_{BA} has a limited range from 0V to –300V.

3) Manual ID Selection Position Compensation (V_{BM})

This machine does not shift the bias according to the manual ID selection position. The grid voltage and exposure lamp voltage shift to control the image density. Refer to the optics section.

4) User Tool Mode ID Selection Compensation (V_{BU})

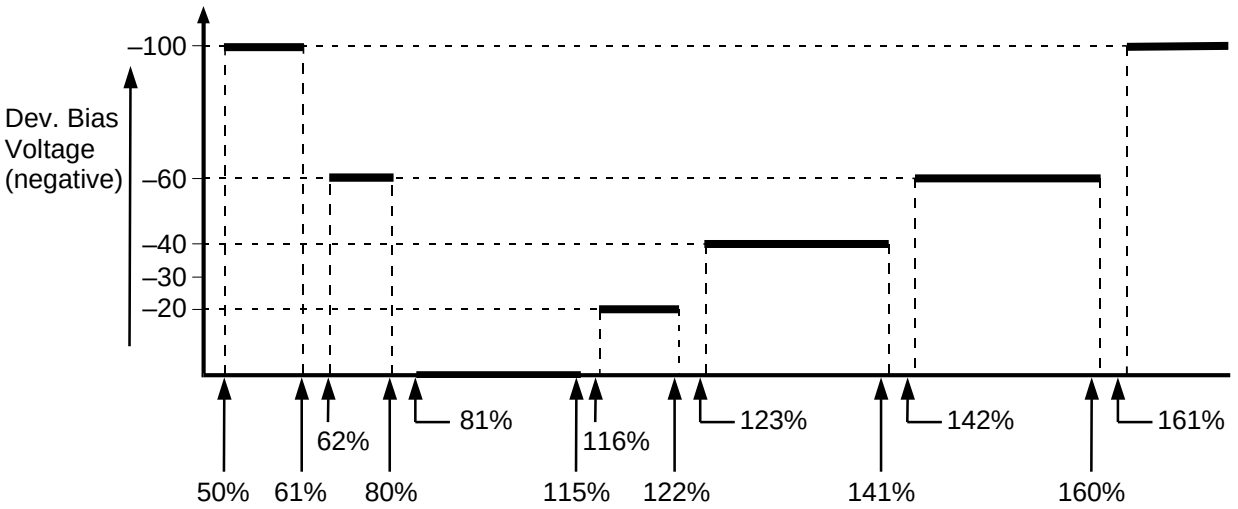
In User Tool mode, there are 7 selectable steps for the image density level. The User Tool ID position setting determines the V_{BU} as follows:



A246D562.WMF

5) Magnification Compensation (V_{BMG})

The selected reproduction ratio determines V_{BMG} as follows:

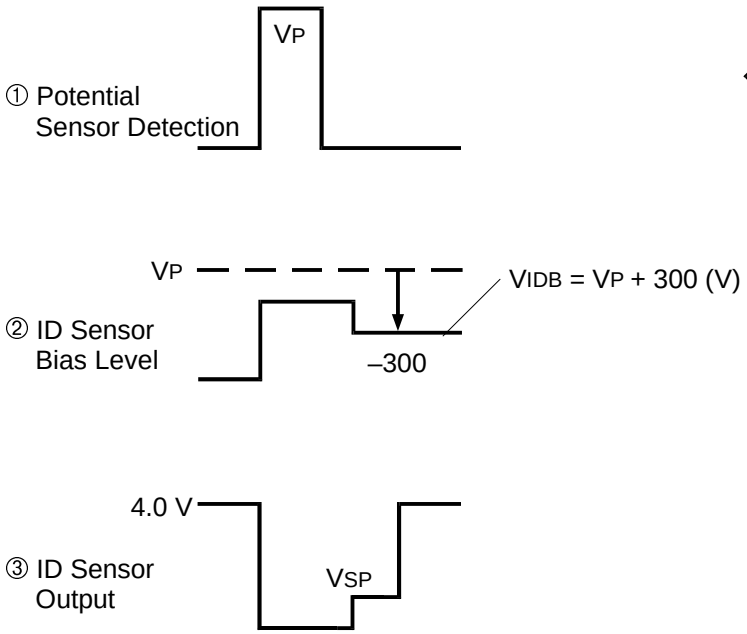


A246D563.WMF

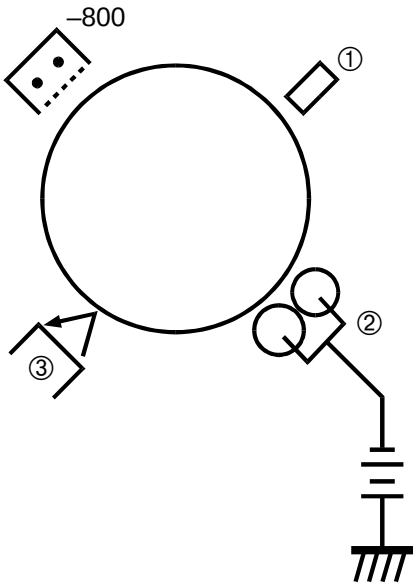
Bias Control Out of Copy Cycle

To hold the toner on the sleeve rollers while they are rotating without image development, "V_B + (–60 V)" is applied.

ID Sensor Pattern Bias



A246D564.WMF



A246D565.WMF

While developing the ID sensor pattern, ID sensor bias is applied. ID sensor bias is determined during the process control initial setting as follows:

A charge is applied while grid voltage is –800 V to create the ID sensor pattern.

The drum potential (V_P) of the ID sensor pattern is checked.

The ID sensor bias (V_{IDB}) is adjusted to satisfy the following formula:

$$V_{IDB} = V_P - (-300)$$
$$= V_P + 300 \text{ (V)}$$

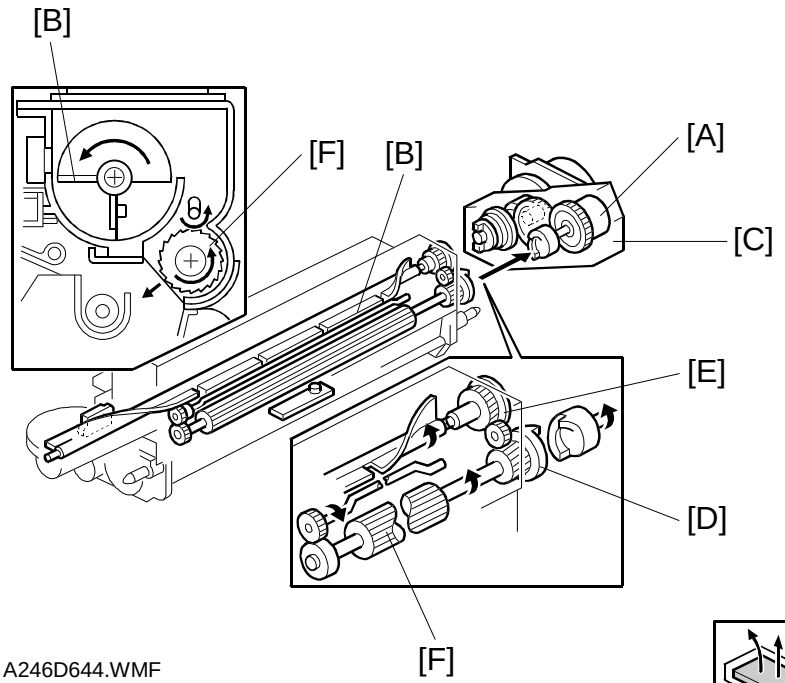
V_P Auto Shift (SP1-16-1)

The triboelectric charge generated on the toner and carrier become greater in accordance with the copy quantity and is stabilized 450 minutes later after the developer initial setting.
The value of the V_P is compensated as shown in the table.

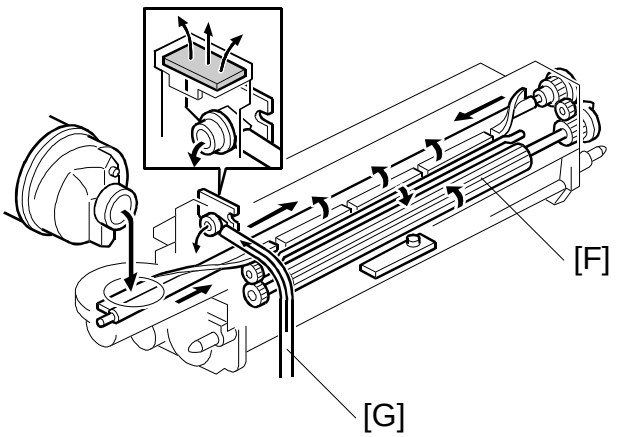
Period of the development motor rotation after developer initial setting	0 ~ 420	420 ~ 430	430 ~ 440	450 ~
Added value to V_P value	+40 V	+30 V	+20 V	0 V

2.5.6 TONER SUPPLY

Toner Supply Mechanism



A246D644.WMF

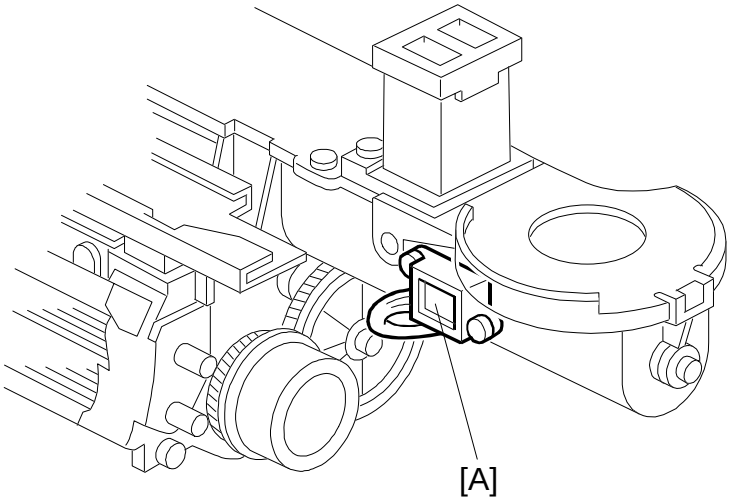


A246D645.WMF

When the toner supply clutch [A] turns on, the agitator [B] mixes the recycled toner transported by the air tube [G] with new toner. Then it moves the toner from the front to the rear and sends it to the toner supply roller.

The toner supply clutch [A] located inside the development motor [C] applies the rotation from the development motor to the toner supply roller gear [D], which drives the agitator gear [E]. The grooves on the toner supply roller [F] catch the toner. Then, as the grooves turn past the opening, the toner falls into the development unit.

Toner End Detection



A246D567.WMF

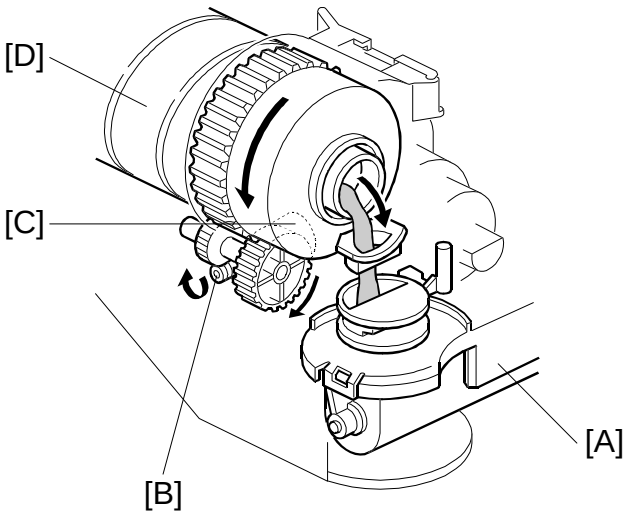
The toner end sensor [A] detects if sufficient toner remains in the toner hopper. The toner end sensor monitors the toner end-condition when the toner supply clutch turns on. When there is only a little toner inside the toner hopper and toner pressure on the toner end sensor is low, the toner end sensor outputs a pulse signal for each copy (one detection per one copy).

The LCD displays the toner near end indication after receiving the pulse signal 150 times. If a pulse signal is not output twice continually, the pulse count is canceled.

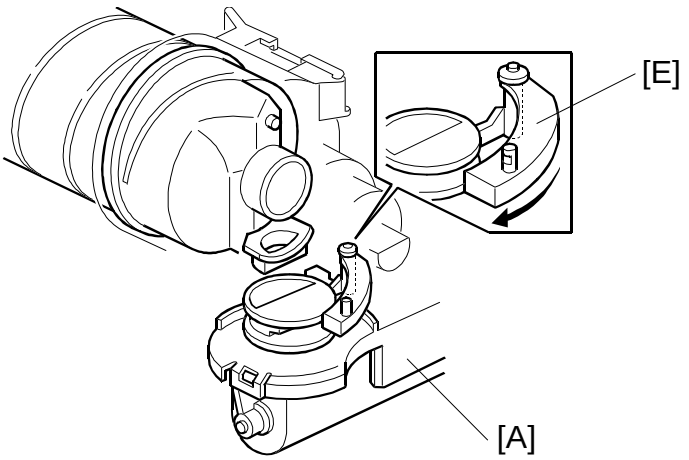
Fifty copies are allowed after entering toner near-end condition. After fifty copies are made in toner near-end condition, the machine enters the toner end-condition and copying is prohibited.

After turning the main switch off and on, or opening and closing the front door, the machine drives the toner supply mechanism and monitors the toner end sensor output. If the toner end sensor does not output the pulse signal twice continually, the toner end condition is canceled.

Bottle Drive Mechanism



A246D646.WMF



A246D647.WMF

The drive mechanism for the bottle transports toner from the bottle to the toner supply unit [A]. A worm gear [B] on the toner-supply motor [C] drives this mechanism. The toner bottle [D] has a spiral groove that helps move toner to the supply unit.

When the toner bottle holder is opened, the shutter hook [E] moves the toner shutter, which closes the toner supply unit and prevents the toner in the toner holder from spilling out.

The drive motor for the bottle turns on after 1.1 seconds when the toner end sensor turns on five times continually.

Toner Supply Control

By using an SP mode (SP1-13-1), 3 kinds of toner-supply controls are available:

- Auto Process Control Mode
- Detect Mode
- Fixed Mode

1) Auto Process Control Mode
Originals have various image proportions and image densities. To control the toner supply in the best manner, it is necessary to link the amount of toner supplied on each copy cycle to the amount of toner consumed for each copy. This model uses **Fuzzy Control** to provide this kind of toner supply control.

Fuzzy Control 1
According to the TD sensor data, the CPU checks the following at every copy cycle:

1. The results from the toner supply control process (TD sensor output) in the previous copy cycle.
2. How quickly the toner density is changing.
Then the CPU decides the appropriate amount of toner (toner supply clutch ON period) for the next copy cycle by using Fuzzy Logic.

Fuzzy Control 2
The image on the OPC drum changes due to variations in toner chargeability (influenced by the environment) even if toner concentration is constant.
The ID sensor directly checks the image on the OPC drum and shifts the V_{REF} data under fuzzy control to keep the image on the OPC drum constant.

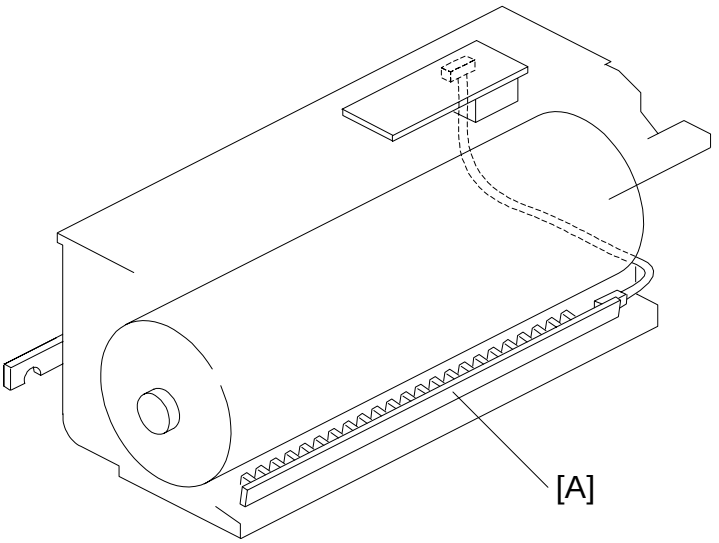
NOTE: The toner supply amount changes every copy cycle.
The target toner density sensor output is updated under the following conditions:
1) During toner density sensor initialization
2) During process control data initialization
3) After the copy job is completed in case that 10 or more copies have been made since the last update.
(Refer to section 2.1.4 “Image Density Control” for details.)

2) Detect Mode
In this mode, only the TD sensor controls the toner concentration (V_{REF} data is fixed). The machine only performs Fuzzy Control 1.
When the ID sensor detects an abnormal condition, the machine automatically enters this mode.

3) Fixed Mode
In this mode, the SP mode determines the fixed amount of toner (4%, 7%, 11%, 14%) supplied every copy cycle (SP1-13-3). There is no over-toning detection mechanism.
When the TD sensor or Drum Potential sensor detect an abnormal condition, the machine automatically enters this mode.

2.6 IMAGE TRANSFER

2.6.1 PRE-TRANSFER LAMP



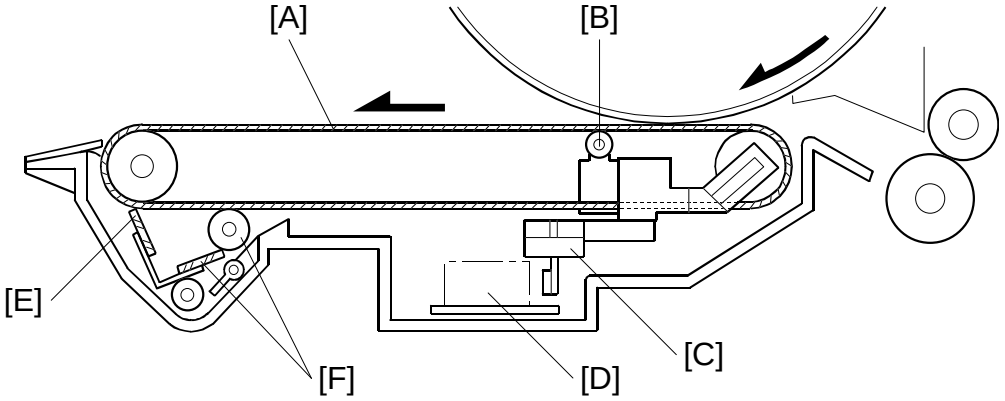
A246D569.WMF

The pre-transfer lamp [A] located in the drum unit prevents incomplete toner transfer.

The pre-transfer lamp illuminates the drum surface after developing the latent image but before transferring the image to the copy paper. This illumination reduces the negative potential on the drum surface, charged by the main charge corona and partially discharged by the exposure. This makes image transfer easier.

The pre-transfer lamp is turned on and off by the charge power pack at the same time as when the main motor turns on and off.

2.6.2 IMAGE TRANSFER AND PAPER SEPARATION OVERVIEW



A246D570.WMF

This model uses a transfer belt unit consisting of the following parts:

[A]: Transfer belt
A belt (length: 321 mm) with high electrical resistance which holds a high negative electrical potential and attracts the toner on the OPC drum onto the paper. Also the electrical potential attracts the paper itself and helps paper separation from the OPC drum.

[B]: Transfer bias roller
Applies transfer voltage to the transfer belt.

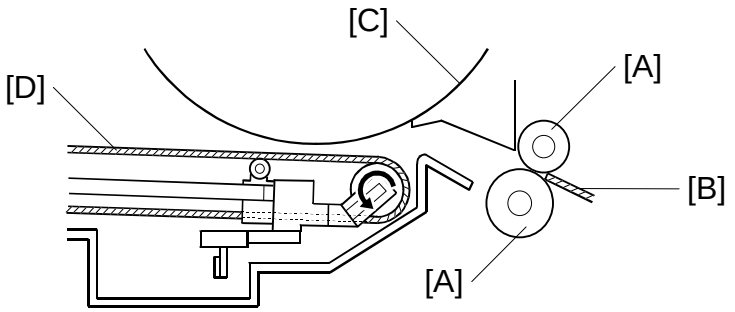
[C]: Transfer belt lift lever (driven by a solenoid)
Lifts the transfer belt to contact the transfer belt with the OPC drum.

[D]: Transfer power pack
Generates the constant transfer current.

[E]: Transfer belt cleaning blade
Removes toner attached on the transfer belt to prevent stains on the rear side of the paper.

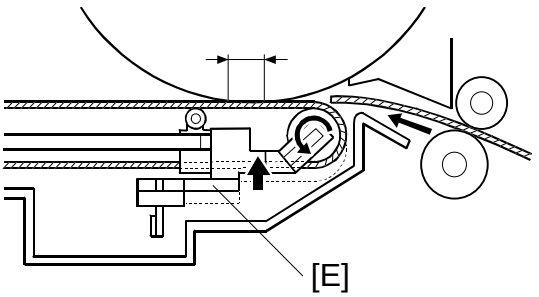
[F]: Transfer belt cleaning bias roller and bias roller blade
Even if the toner is not removed completely by the transfer belt cleaning blade, the toner is attracted to the negative charged cleaning bias roller. The bias roller blade scrapes off the toner on the cleaning bias roller.

2.6.3 IMAGE TRANSFER AND PAPER SEPARATION MECHANISM



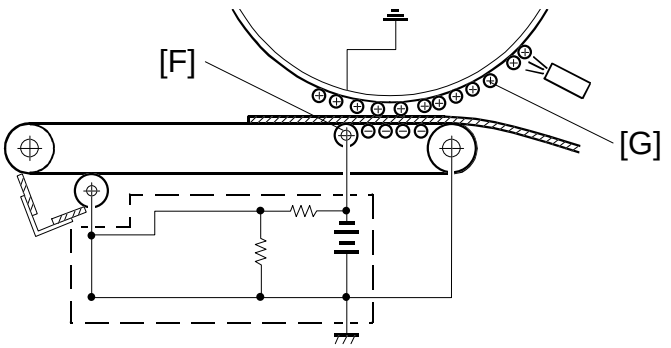
A246D571.WMF

The registration rollers [A] start feeding the paper [B] into the gap between the OPC drum [C] and the transfer belt [D] at the proper time.



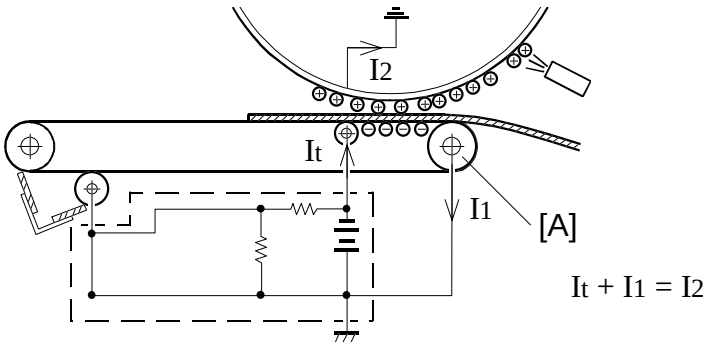
A246D572.WMF

When the leading edge of the paper reaches the gap between the transfer belt and the OPC drum, the transfer belt lift lever [E] immediately raises the transfer belt into contact with the transfer belt and the OPC drum. A solenoid drives the lift lever.



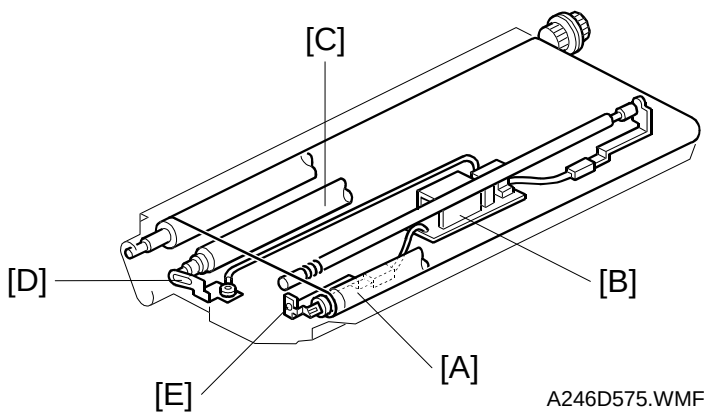
A246D573.WMF

Then a negative transfer bias is applied to the transfer bias roller [F] and attracts the positively charged toner [G] on the OPC drum. It also attracts the paper and separates the paper from the OPC drum.



A246D574.WMF

After the image transfer is completed, the charge on the transfer belt holds the paper on the transfer belt. After separating the paper from the transfer belt, the transfer belt drive roller [A] discharges the transfer belt.



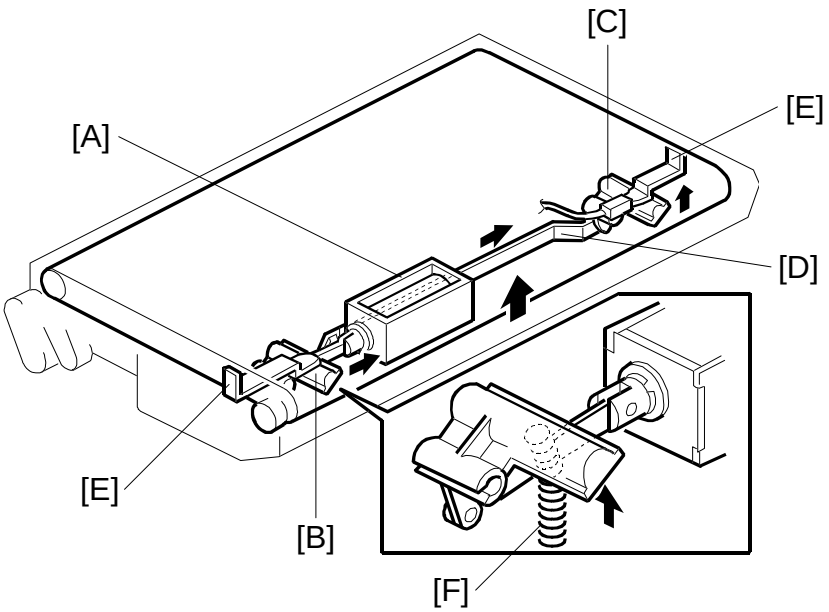
A246D575.WMF

The transfer power pack [B] inside the transfer belt unit monitors the current (I_1) fed back from the drive rollers at each end of the transfer belt to adjust the transfer current.

Then, the power pack adjusts it to maintain a constant current through the drum (I_2), even if the paper, environmental conditions, or transfer belt surface resistance change.

4/5 of the voltage for the transfer belt bias roller is applied to the transfer belt cleaning bias roller [C] through the cleaning bias terminal [D] from the power pack. The grounding terminal [E] grounds the transfer belt drive roller.

2.6.4 TRANSFER BELT UNIT LIFT MECHANISM

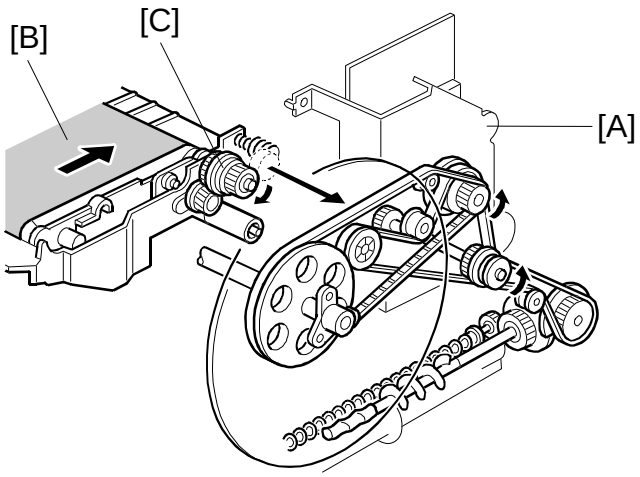


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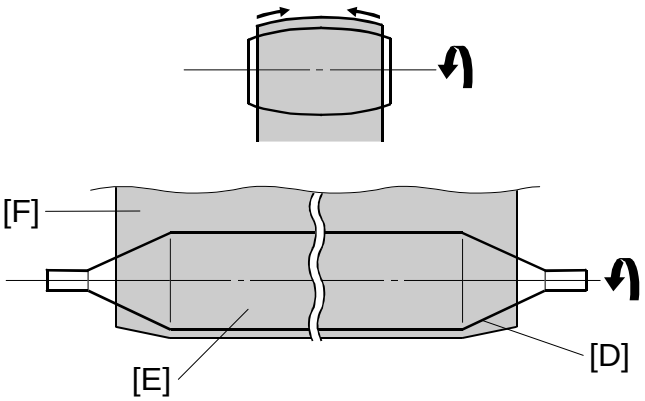
The transfer belt lift solenoid [A] located inside the transfer belt unit turns on to raise the transfer belt into contact with the OPC drum at the appropriate time. Links [D] connect the front lever [B] and the rear lever [C] to the solenoid and push up the stays [E] when the solenoid turns on.
The support spring [F] helps the solenoid to raise the transfer belt.
The solenoid turns off after the copy job is finished.
The transfer belt must be released from the OPC drum for the following reasons:

1. To prevent the ID sensor pattern on the OPC drum from being rubbed by the transfer belt because the transfer belt is located between the development unit and the ID sensor.
2. To decrease the load sent to the transfer belt-cleaning blade, it is better to keep toner on the non-image area (for example V_D, V_L, ID sensor pattern developed during process control data initialization) from being transferred onto the transfer belt.
3. To prevent changes to OPC drum characteristics influenced by additives inside the rubber belt.

2.6.5 PAPER TRANSPORTATION AND BELT DRIVE MECHANISM



A246D577.WMF



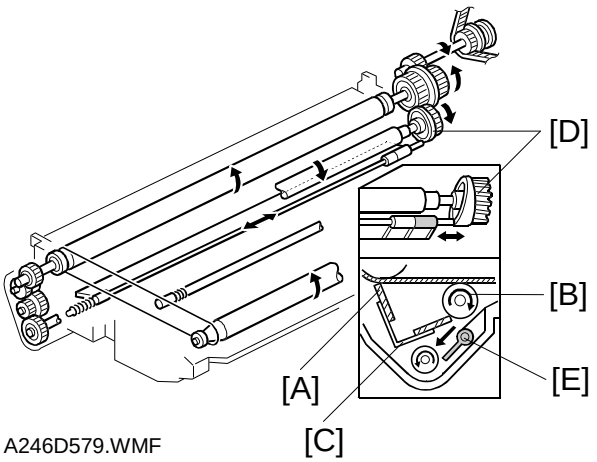
A246D578.WMF

The main drive motor [A] drives the transfer belt through the belt and gears. Since the transfer belt electrically attracts the paper [B], the transport fan is not required.

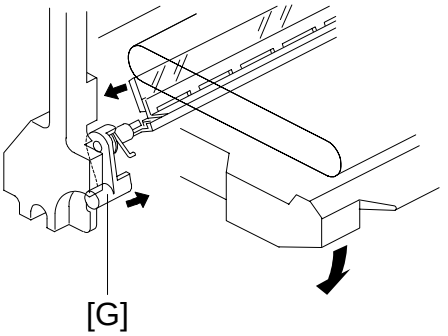
At the turn in the transfer belt, the belt is discharged by the transfer belt drive roller [C] to reduce paper attraction, and the paper separates from the belt as a result of its own stiffness.

The tapered parts [D] at both sides of the roller [E] help keep the transfer belt [F] in the center, so that it does not run off the rollers.

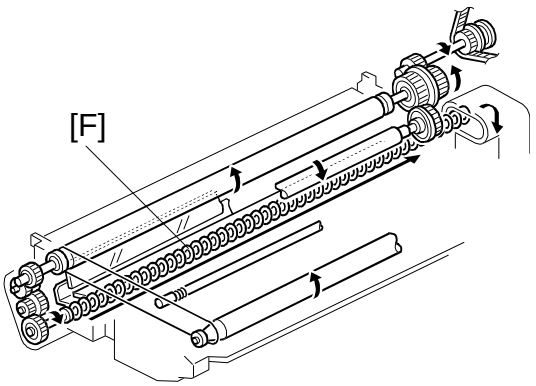
2.6.6 TRANSFER BELT CLEANING MECHANISM



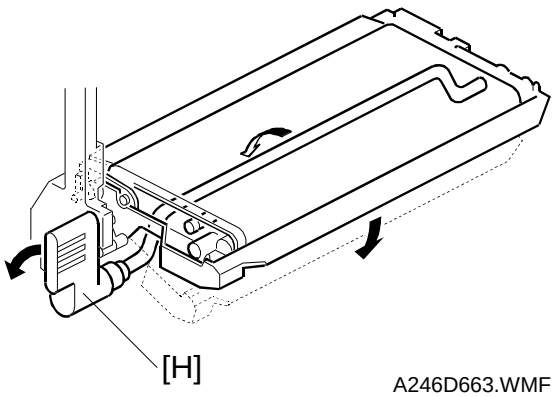
A246D579.WMF



A246D580.WMF



A246D581.WMF



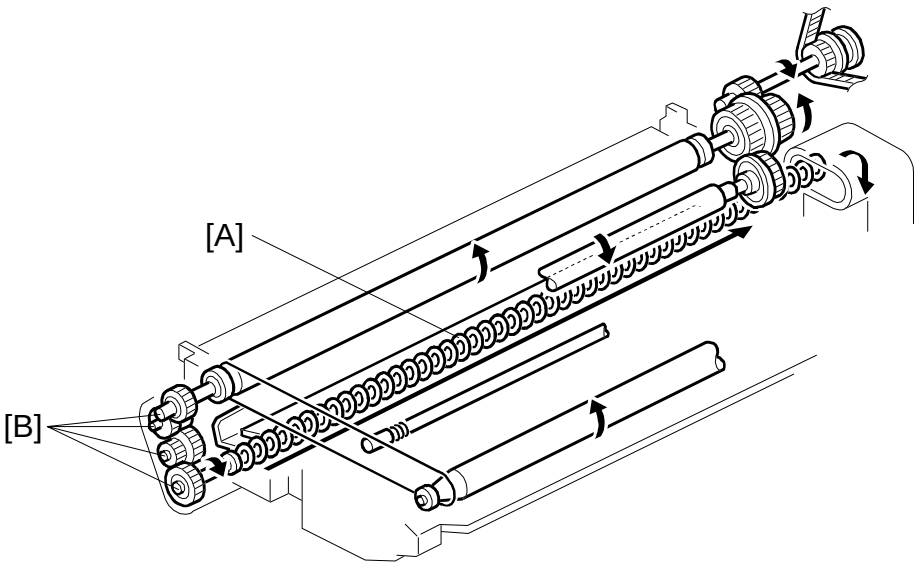
A246D663.WMF

Some toner may adhere to the transfer belt when a paper jams occurs, or when the side fences for the by-pass feed table are set in the wrong position causing the erase lamp to miss some toner. Removing adhered toner prevents the rear side of the copy paper from getting dirty. The cleaning blade [A] scrapes off any toner remaining on the transfer belt. A counter blade system cleans the transfer belt. Even if the toner is not completely removed due to paper dust stuck on the transfer belt cleaning blade [A], the negative charged cleaning bias roller [B] attracts the remaining toner. The bias roller blade [C] scrapes off the toner on the cleaning bias roller. The surface of the transfer belt is coated to make it smooth and prevent the transfer belt from flipping the cleaning blade.

The gear [D] moves the agitator plate [E] from side to side to transport toner to the toner collection coil [F]. The coil transports the toner cleaned off the transfer belt to the toner recycle unit.

The lever [G] on the front end of the cleaning blade releases the cleaning blade when the transfer belt unit is lowered and the lever is pushed by the transfer belt unit support prop. (When the lever [H] turns counter-clockwise, the transfer belt unit lowers.)

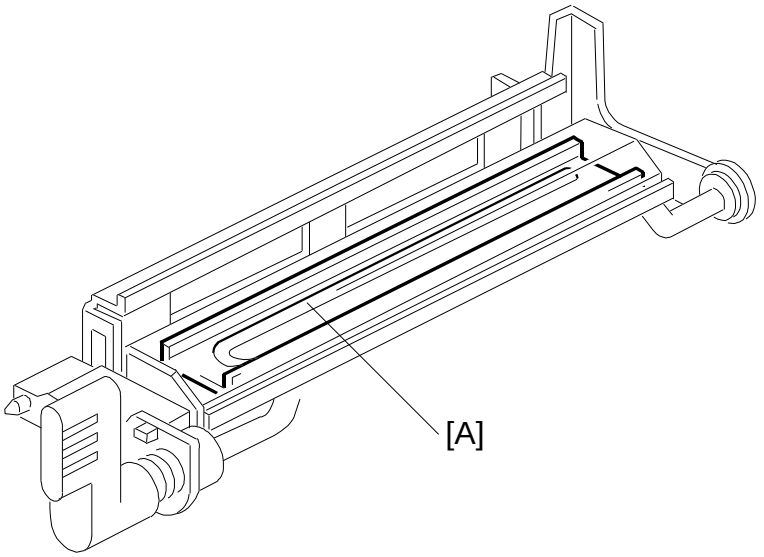
2.6.7 TONER COLLECTION MECHANISM



A246D582.WMF

The idle gear [B] transmits the transfer belt drive to the toner collection coil [A]. The toner collection coil transports the collected toner to the toner-recycling unit. See Drum Cleaning and Toner Recycling for details.

2.6.8 TRANSFER ANTI-CONDENSATION HEATER

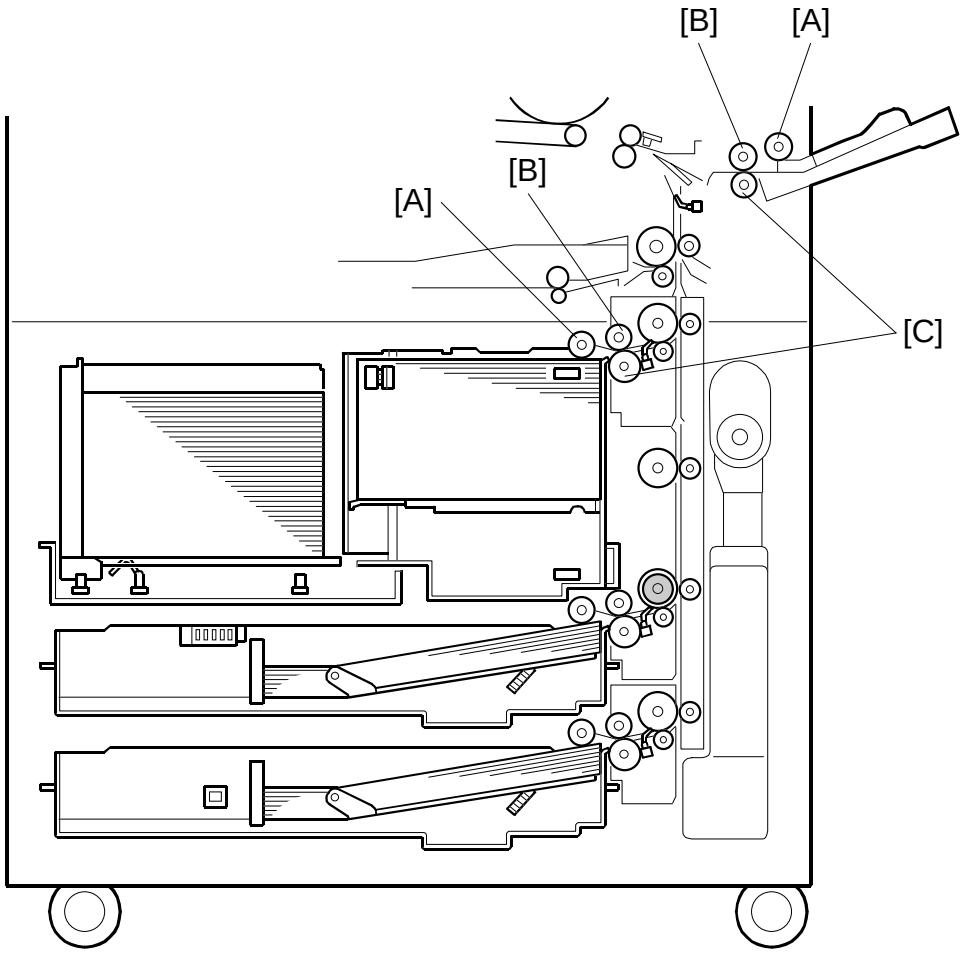


A246D648.WMF

The transfer anti-condensation heater [A] is under the transfer belt unit. It turns on when the main switch is off to prevent moisture from forming on the transfer belt.

2.7 PAPER FEED

2.7.1 OVERVIEW



A246D583.WMF

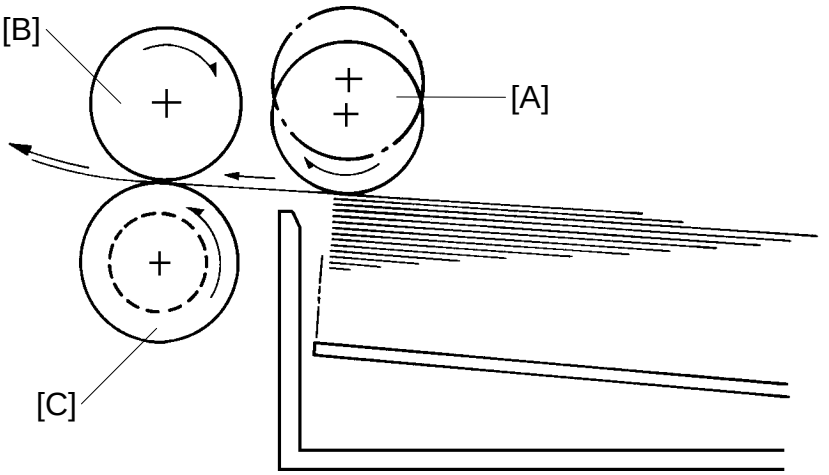
This model has three paper tray feed stations.

The 1st tray is the tandem feed tray. It can hold 3,100 (1,550 x 2) sheets of paper. The 2nd tray is universal tray. It can hold 550 sheets of paper. The 3rd tray also can hold 550 sheets of paper.

The by-pass feed table, which has an independent feed mechanism, can also feed paper. The by-pass feed table can hold 50 sheets of paper.

All feed stations use an FRR feed system. Rotation of the pick-up roller [A] drives the top sheets of paper from each tray to the feed [B] and separation [C] rollers. The feed and separation rollers then take over the paper drive. If the pick-up roller feeds more than one sheet, the separation rollers rotate in the opposite direction and prevent all but the top sheet from passing through to the registration rollers.

2.7.2 FRR FEED SYSTEM



A246D584.PCX

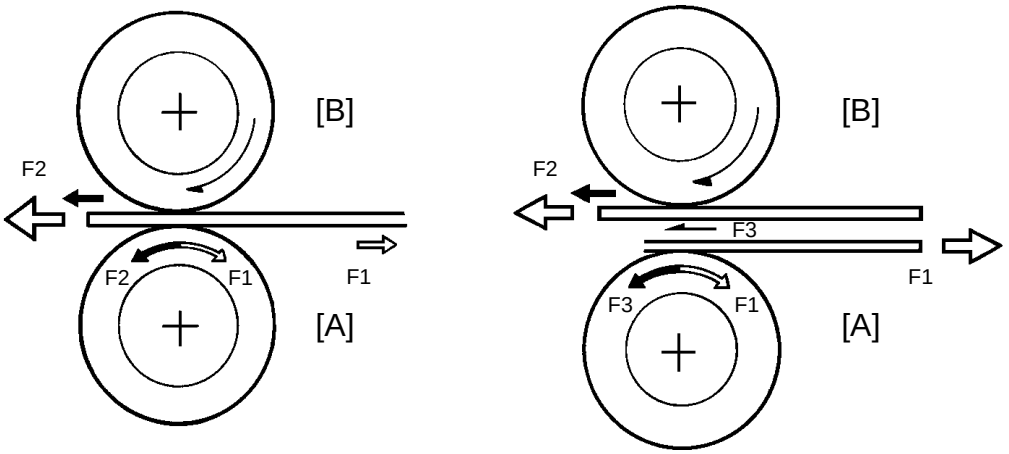
This copier uses an FRR paper feed system using three rollers.

Pick-up Roller

The pick-up roller [A] is not in contact with the paper stack before it starts feeding paper. Shortly after the Start key is pressed, the pick-up roller drops down and feeds the top sheet between the feed [B] and the separation rollers [C]. At almost the same time that the leading edge of the paper arrives at the feed roller, the pick-up roller lifts off the paper stack so that it does not interfere with the operation of the feed and separation rollers. The feed and separation rollers then take over the paper feed process.

Feed and Separation Rollers

There is a one-way bearing inside the feed roller so it can turn only in one direction. The separation roller turns in the opposite direction of the feed roller. The separation roller, however, has a slip clutch (torque limiter clutch), which allows it to turn in either direction depending on the friction between the rollers. The separation roller solenoid keeps the separation roller in contact with the feed roller.

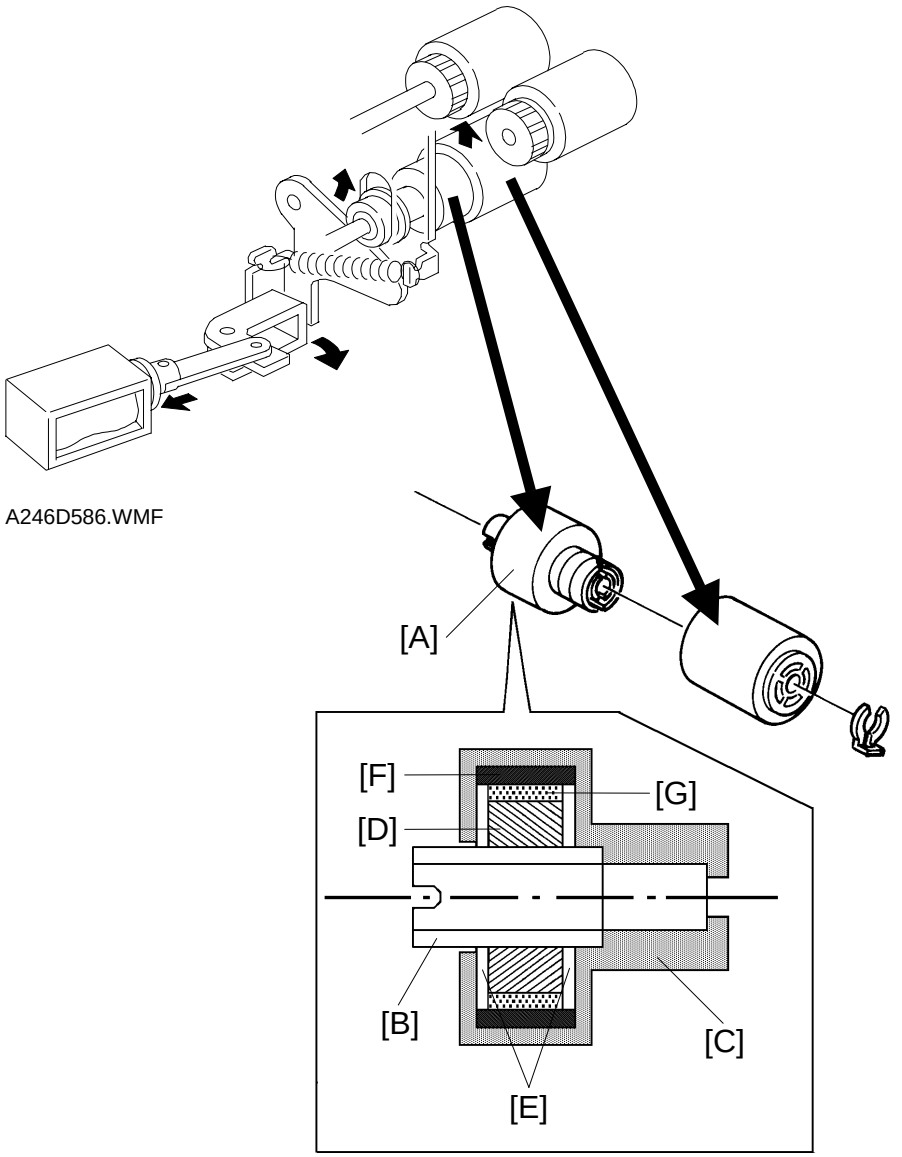


A246D585.PCX

The direction in which the separation roller [A] turns depends on the frictional forces acting on it. The slip clutch applies a constant clockwise force (F1). When there is a single sheet of paper between the rollers, the force of friction between the feed roller [B] and the paper (F2) is greater than F1. Therefore, the separation roller turns counter-clockwise.

If two or more sheets are fed between the rollers, the forward force on the second sheet (F3), becomes less than F1 because the friction between the two sheets is small. So, the separation roller starts turning clockwise and drives the second sheet back to the tray.

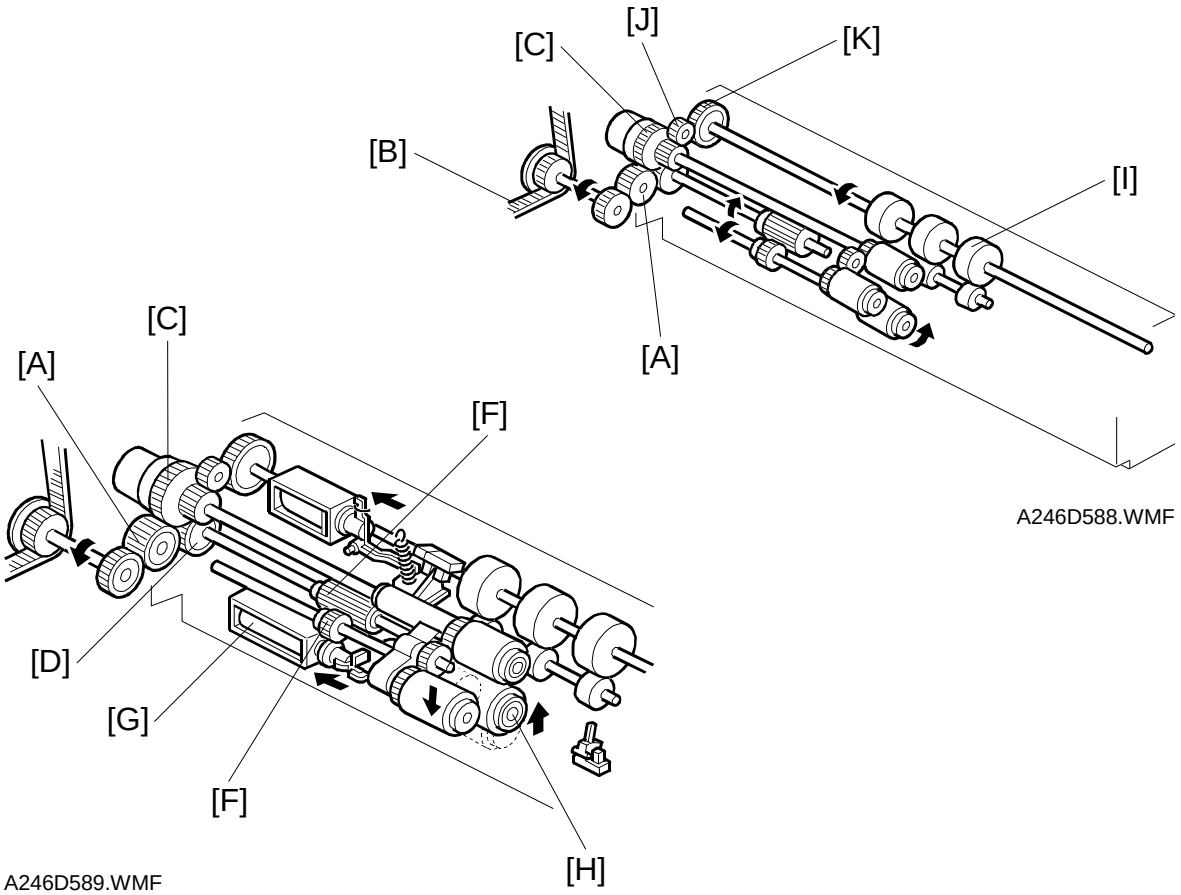
2.7.3 SLIP CLUTCH MECHANISM



The slip clutch [A] consists of the input [B] and output hubs [C]. The magnetic ring [D] and the steel spacers [E] are fitted onto the input hub. The ferrite ring [F] is fitted into the output hub. Ferrite powder [G] packed between the magnetic ring and the ferrite ring [F] generates a constant torque due to magnetic force. The input hub and the output hub slip when the rotational force exceeds the constant torque.

This type of slip clutch does not require lubrication.

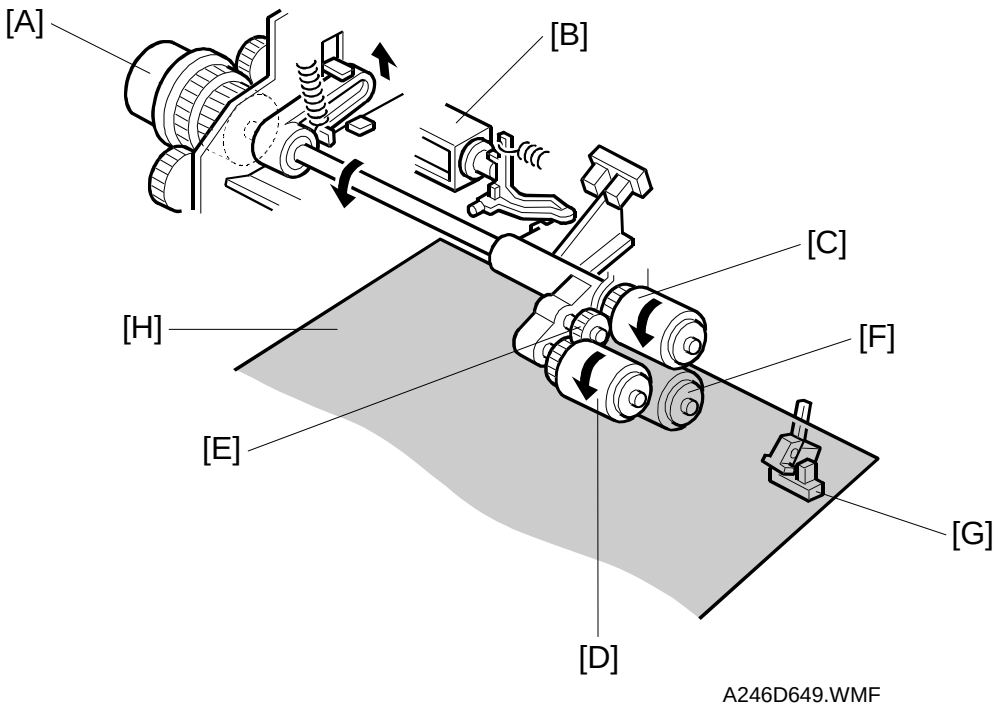
2.7.4 FRR FEED DRIVE MECHANISM



The rotation of the paper feed motor is transmitted to the gear [A] via the timing belt [B], and then transmitted to the separation roller via the feed clutch gear [C], gear [D], gear [E] and gear [F].

If the paper feed station remains unselected, the separation-roller solenoid [G] de-activates and the separation roller [H] rotates freely in the reverse direction of paper feeding.

The gear [A] also transmits drive to the vertical transport roller [I] via three other gears [C], [J] and [K].



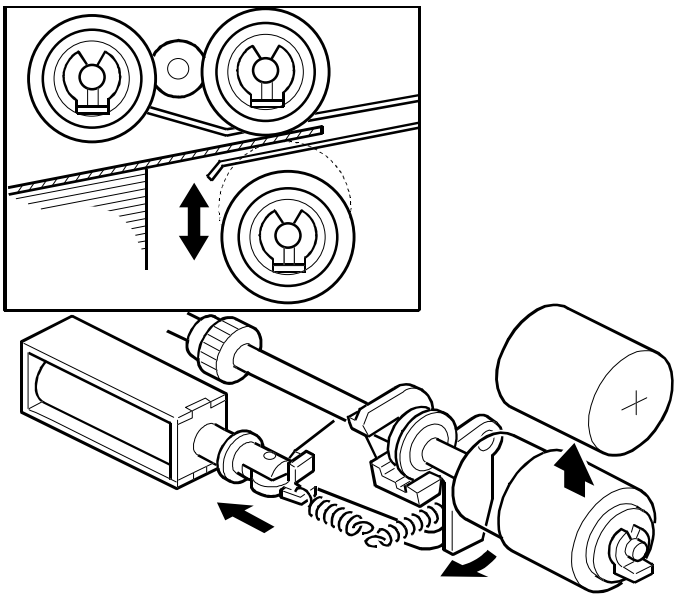
After selecting the paper feed station and pressing the start key, the feed clutch [A], separation roller solenoid, and the pick-up solenoid [B] turn on at once.

When the feed clutch [A] activates to rotate the feed roller [C], the feed roller and the pick-up roller [D] turn together because the idle gear [E] links them.

When the separation roller solenoid turns on, the separation roller [F] makes contact with the feed roller [C] then rotates together with the feed roller. This occurs despite the fact that the separation rollers move in the opposite direction. The separation rollers move like this because of the torque limiter function in the separation roller [F].

When the pick-up solenoid [B] activates, the pick-up roller [D] lowers to make contact with the top sheet of the paper stack and send it to the feed and separation rollers. When the paper feed sensor [G] detects the leading edge of the paper [H]; the pick-up solenoid de-energizes to lift the pick-up roller. The paper feed clutch also de-energizes at a certain time to wait until it is ready to feed to the registration roller.

2.7.5 SEPARATION ROLLER RELEASE MECHANISM



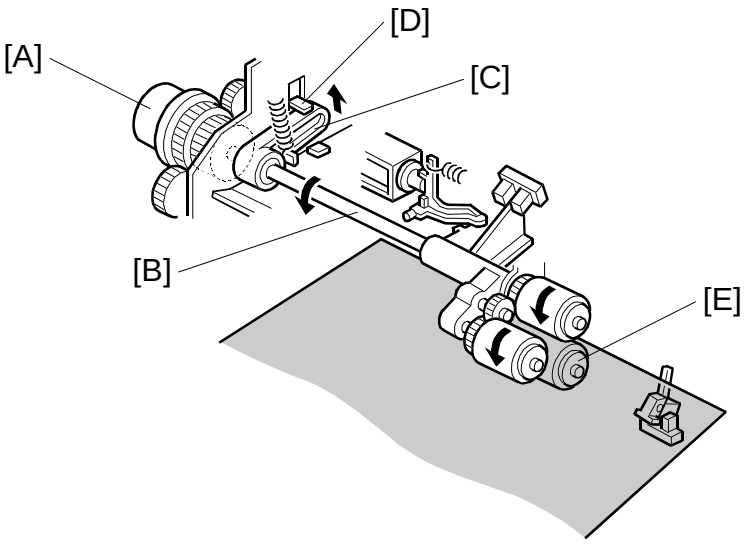
A246D591.WMF

In this model, the separation roller [A] is normally away from the feed roller [B]. After selecting the paper feed station, the separation roller solenoid [C] activates causing contact between the separation roller and the feed roller as explained in the previous two pages.

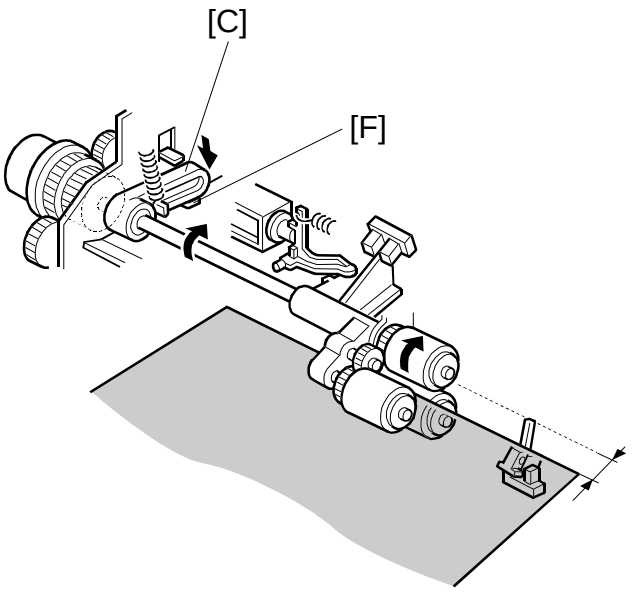
This contact/release mechanism has the following three advantages:

1. When the paper feed motor turns on, the separation rollers in each feed station rotate. If the separation roller is away from the feed roller, it reduces the mechanical load on the paper feed motor and drive mechanism. It also reduces the wear on the rubber surface of the separation roller, which is due to the friction between the separation roller and the feed roller.
2. After paper feeding is complete, paper sometimes remains in the gap between the feed roller and the separation roller.
   If the feed tray is in this condition, it is possible for the remaining paper to be torn.
   When the separation roller is away from the feed roller, remaining paper is released from the gap between the feed and the separation rollers.
3. When paper miss-feeds occur around this area, the customer can easily pull out the jammed paper between the feed and the separation rollers because the separation roller is away from the feed roller.

2.7.6 PAPER RETURN MECHANISM



A246D592.WMF



A246D593.WMF

When the paper feed clutch [A] activates and the feed roller drive shaft [B] rotates, the lever [C] rotates together with the shaft. However, the stopper [D] immediately stops the lever.

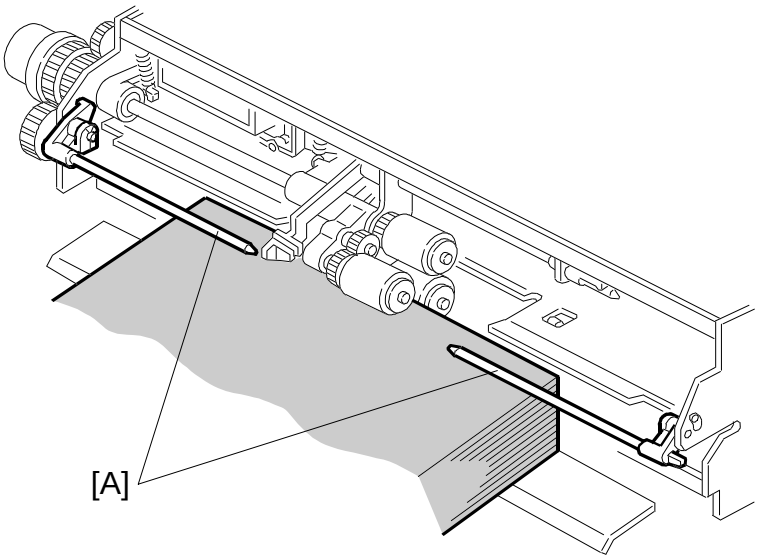
After all paper is fed and the paper feed clutch turns off, the paper feed motor still rotates to turn the separation roller [E] in the reverse direction. The separation roller, still contacting the feed roller, turns the feed roller in the reverse direction until the lever hits the rubber cushion [F].

By this feed roller reverse mechanism, the paper remaining in the gap between the feed and the separation rollers returns 3-mm to the paper feed tray.

After that, the separation roller solenoid turns off to move the separation roller away from the feed roller. This releases the leading edge of the paper and drops the paper to the paper feed tray.

This prevents the remaining paper from tearing when drawing out the feed tray.

2.7.7 PAPER SKEW PREVENTION MECHANISM



A246D595.WMF

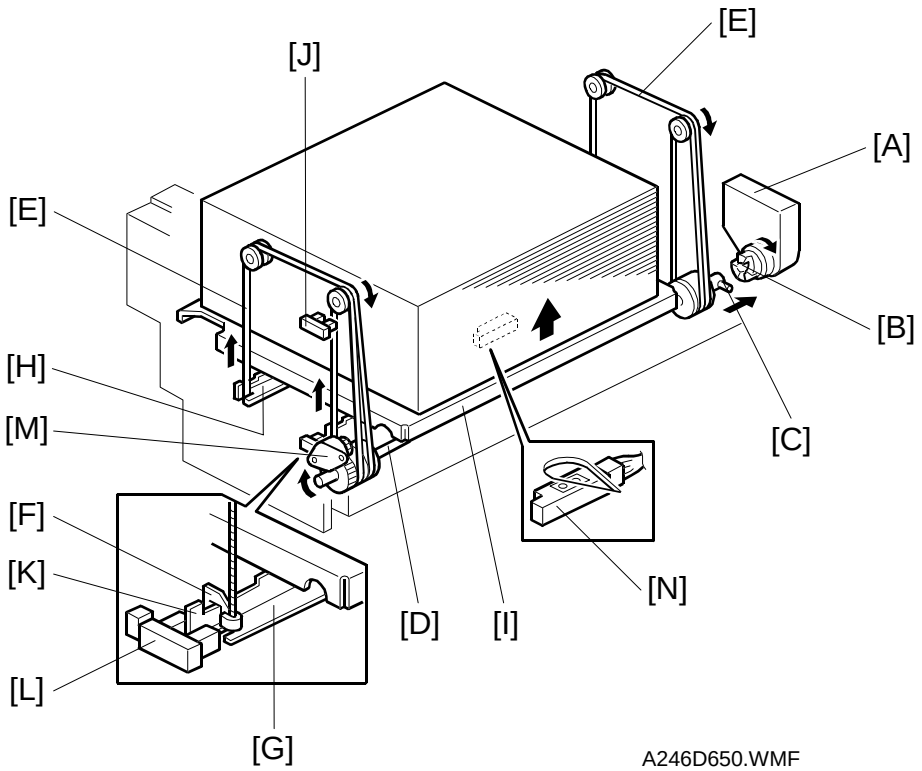
To prevent paper skew or jam, the corner holders have both paper press arms [A] press down both paper side edges, especially in the case of paper with a face curl. This keeps the tray side fences from guiding the paper.

2.7.8 PAPER LIFT MECHANISM

When the tray is set in the machine, it detects this condition in several ways.

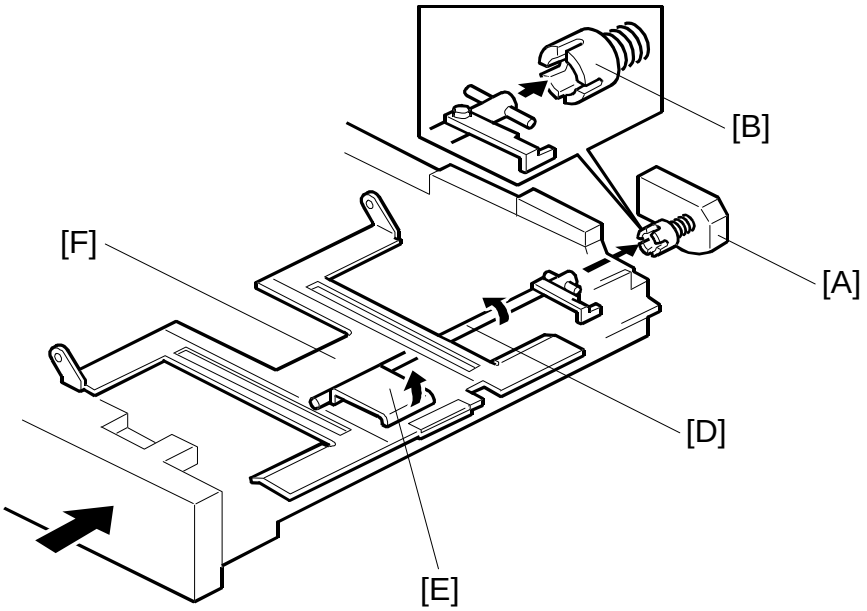
The 1st tray detects by the tray set signal through the connector.
The 2nd tray detects by paper size switch, and the 3rd tray detects by tray set switch.

1st Tray Lift Mechanism



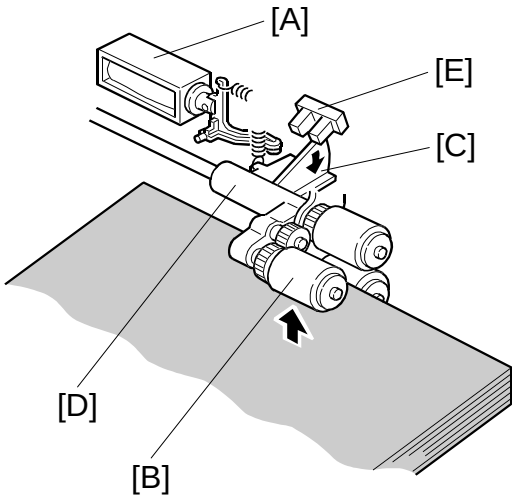
When the machine detects that the 1st paper tray is set in the machine, the lift motor [A] rotates and the coupling gear [B] on the tray lift motor engages the pin [C] of the lift arm shaft [D]. The tray wires [E] are fixed in the slots [F] at the ends of the tray support rods [G, H]. When the lift motor rotates clockwise, the tray support rods and the tray bottom plate [I] move upward. The tray goes up until the top paper pushes up the pick-up roller and the lift sensor in the 1st feed unit is activated.
When the actuator [K] on the front end of the right support rod [G] activates the paper near end sensor [J], the paper near end condition is detected.
When drawing out the tray, the coupling gear [B] separate from the pin [C], so that the tray bottom plate move downward. The tray goes down until the actuator activates the tray down sensor [L]. The damper [M] lets the tray bottom plate drop down slowly.
The paper sensor for the right tray [N] checks that there are sheets of paper in right tandem tray. If the machine determines that there are sheets of paper not using the right tray paper sensor, it needs the bottom plate to go upward toward the paper end sensor. The tandem tray capacity is 1,550 sheets, so it needs a long time to check. Therefore, the right tray paper sensor is necessary.

2nd and 3rd Tray Mechanism

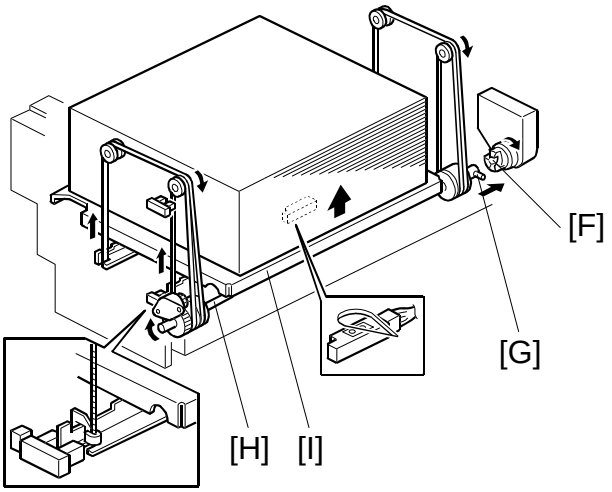


A246D596.WMF

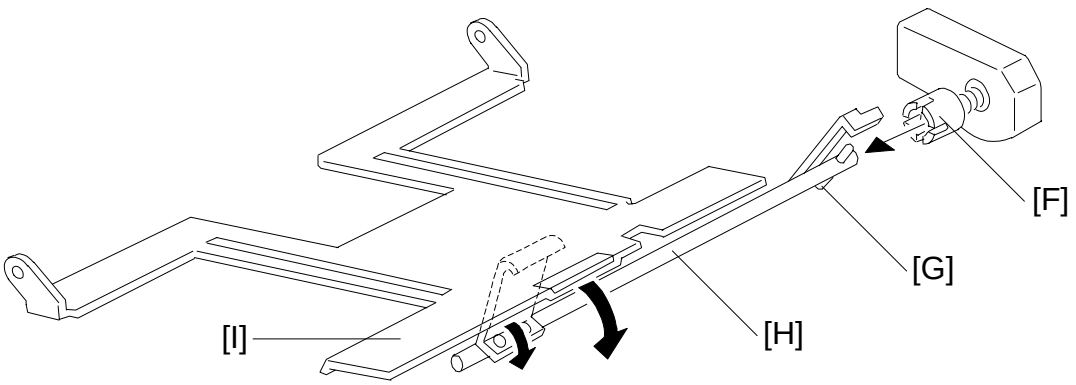
When the machine detects that the paper tray is in the machine, the lift motor [A] rotates and the coupling gear [B] on the tray lift motor engages the pin [C] for the lift arm shaft [D]. Then it turns the tray lift arm [E] to lift the bottom plate for the tray [F].



A246D597.WMF



A246D598.WMF



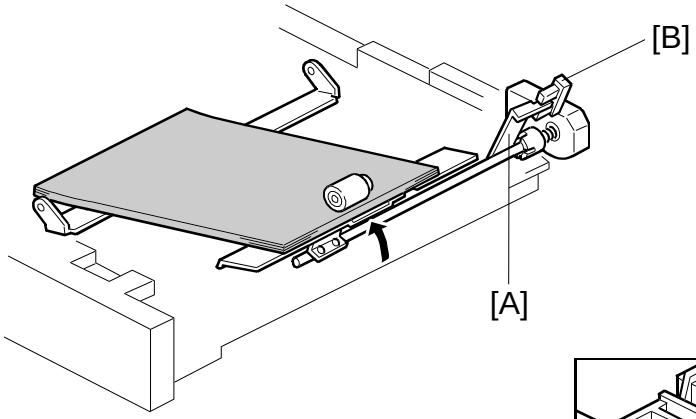
A246D590.WMF

When the lift motor turns on, the pick-up solenoid [A] activates to lower the pick-up roller [B]. When the top sheet of paper reaches the proper paper feed level, the paper pushes up the pick-up roller and the actuator [C] on the pick-up roller supporter [D] activates the lift sensor [E] to stop the lift motor.

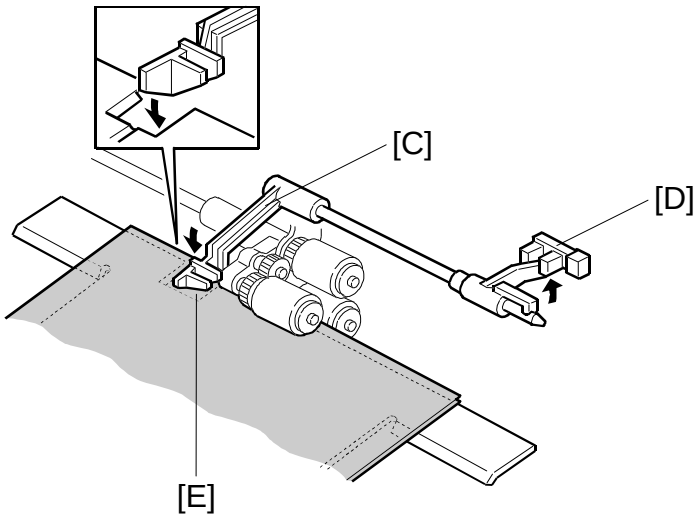
After several paper feeds, the paper level gradually lowers then the lift sensor is de-activated and the lift motor turns on again until the lift sensor is activated again.

When the tray is drawn out of the feed unit, the lift motor coupling gear [F] disengages the pin [G] of the lift arm shaft [H], then the tray bottom plate [I] drops.

2.7.9 PAPER NEAR END/PAPER END DETECTION



A246D599.WMF



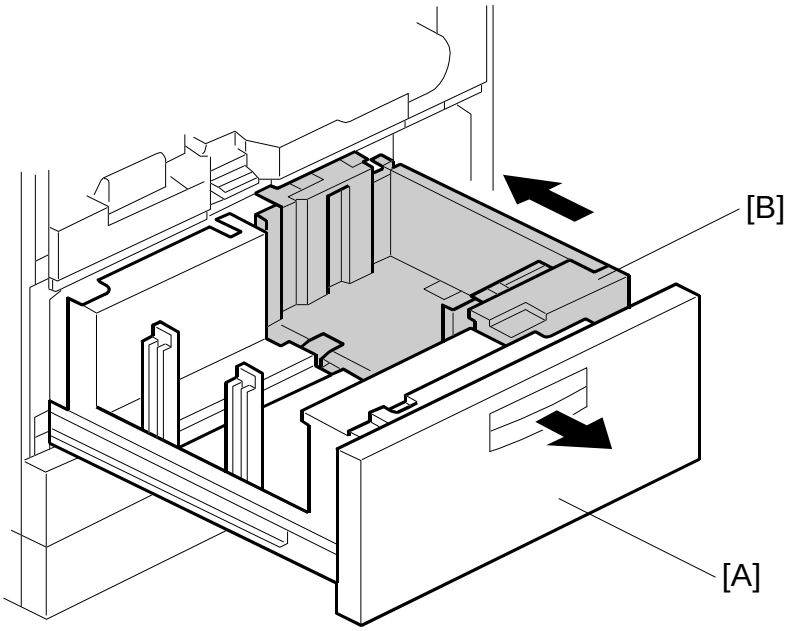
A246D600.WMF

A feeler [A] on the lift arm shaft rotates counterclockwise in accordance with the change of the top paper level. When approximately 50 sheets remain in the tray, the feeler activates the paper near end sensor [B] and informs the copier CPU of the paper near end condition.

If paper in the paper tray, the paper stack raises the paper end feeler [C] and the machine deactivates the paper end sensor [D]. When the paper tray runs out of paper, the paper end feeler drops in the cut out [E] of the tray bottom plate and the machine activates the paper end sensor.

2.7.10 TANDEM FEED TRAY

OVERVIEW

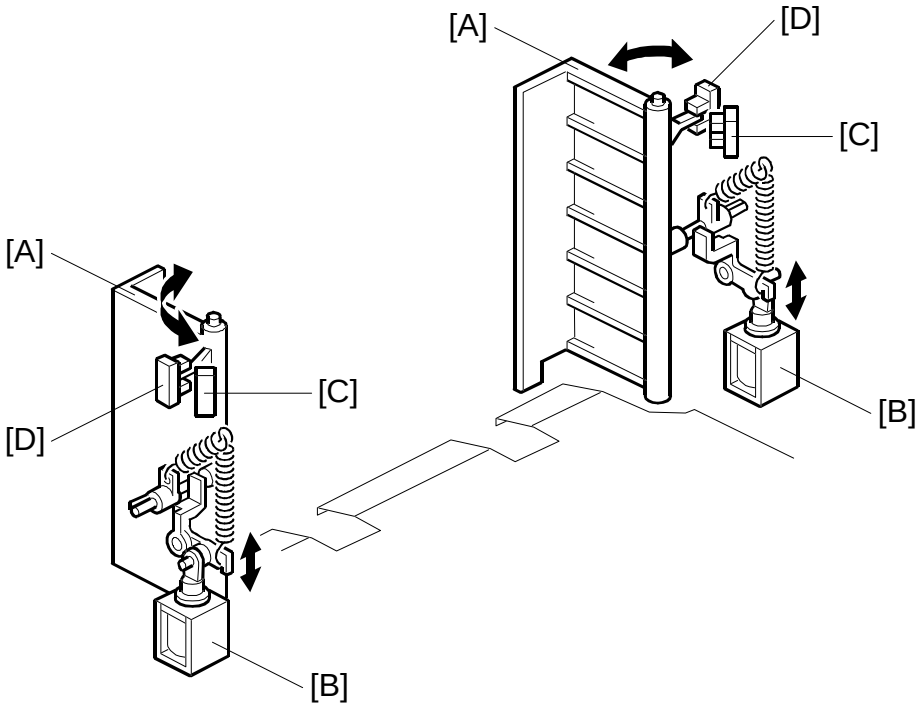


A246D601.WMF

1,550 sheets of paper can be set in each of the left [A] and right trays [B]. Paper is fed from the right tray. When the paper in the right tray runs out, the paper in the left tray automatically transfers to the right tray. After the paper transfer to the right tray, paper feeding resumes.

Normally both the right and the left trays are joined together.
During copying, if there is no paper in the left tray, only the left tray can be pulled out to load paper. During that time, paper feed continues.

Fences Drive Mechanism



A246D603.WMF

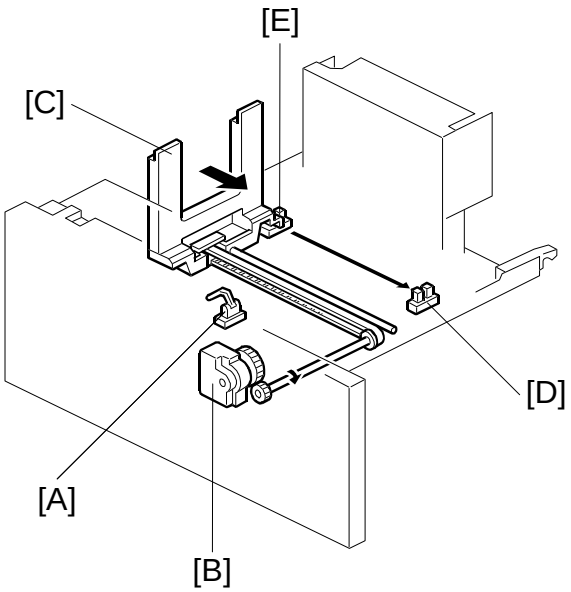
The side fences [A] of the right tray are normally closed. They open only when paper in the left tray goes to the right tray.

The side fence solenoids [B] drive the side fences. When the paper loaded in the left tray transfers to the right tray, the side fence solenoids turn on to open the side fences until the side fence positioning sensor [C] activates.

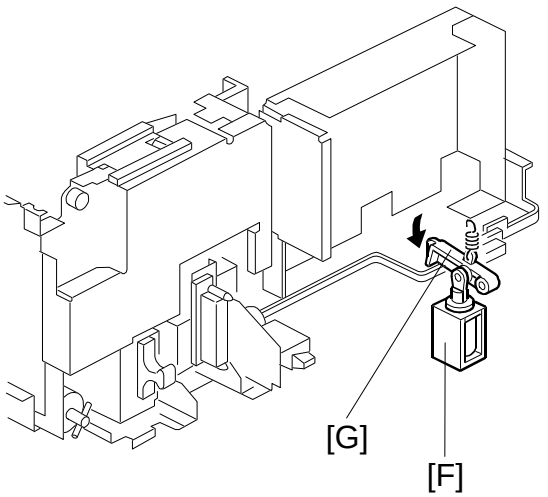
When the rear fence in the left tray pushes paper into the right tray, the side fence solenoids turn off to close the side fences.

When the side fence close sensor [D] actuates after pushing the tandem tray in, the LCD displays a message advising the user to set the paper at the correct position in the tandem tray.

Rear Fence Drive Mechanism



A246D651.WMF



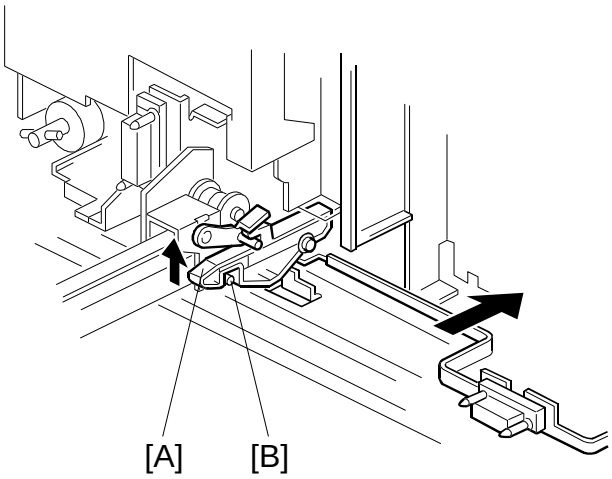
A246D605.WMF

When the paper end sensor [A] in the left tray detects paper and the paper end sensor in the right tray detects the paper end condition, the rear fence drive motor [B] (DC motor) in the left tray rotates counter-clockwise causing the rear fence [C] to push paper into the right tray.

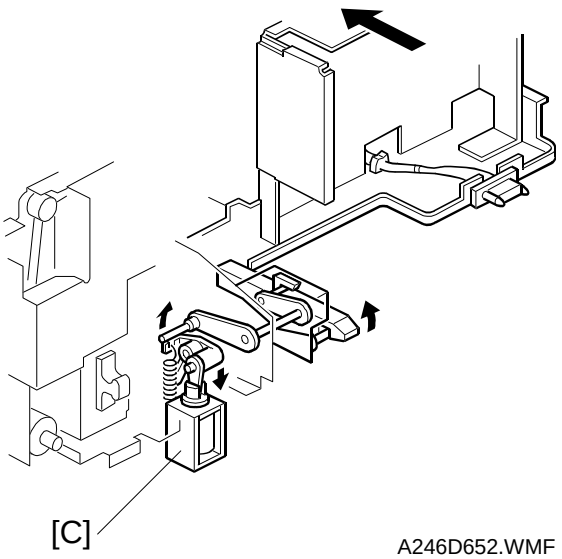
When the actuator on the rear fence activates the return-position sensor [D], the rear fence drive motor rotates clockwise until the actuator activates the rear fence HP sensor [E].

When the rear fence is moving, the left tandem-lock solenoid [F] turns on and the lock lever [G] locks the left tray.

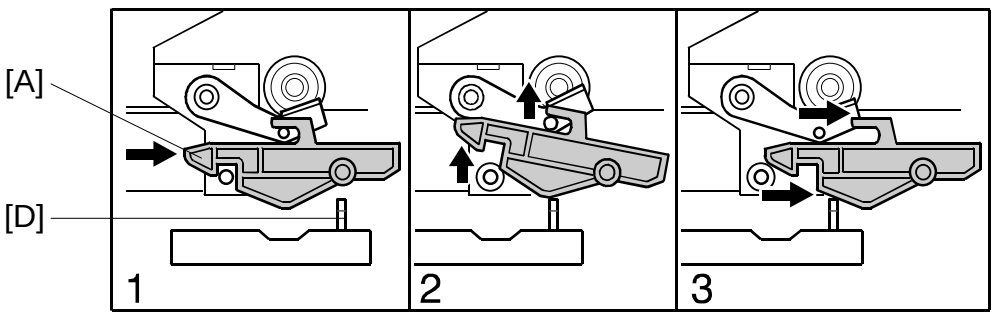
Tray Lock Mechanism



A246D653.WMF



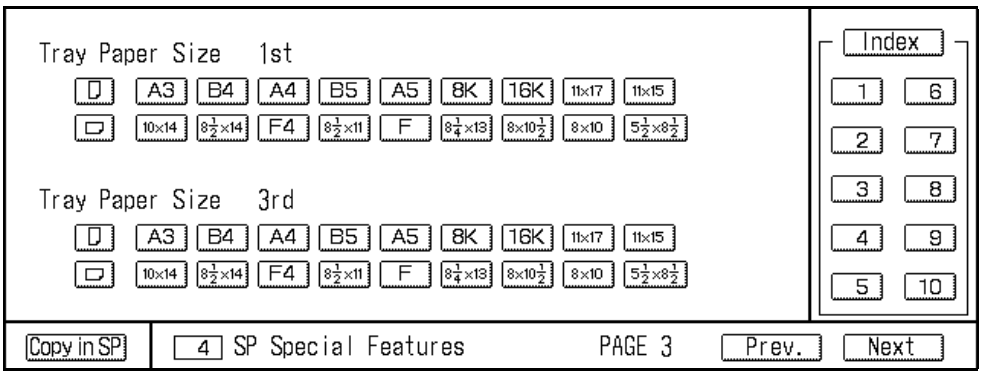
A246D652.WMF



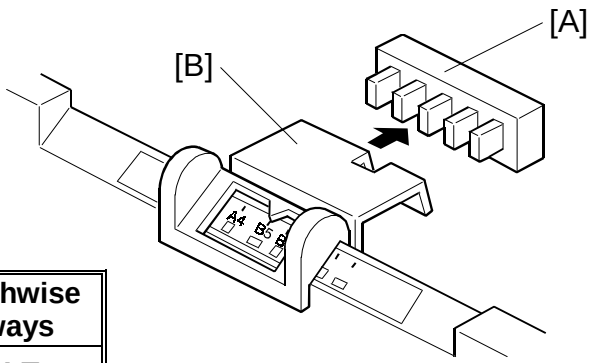
A246D654.WMF

Normally the left tray lock lever [A] in the left tray catches the pin [B] in the right tandem tray. During copying, if there is no paper in the left tray, the tray lock solenoid [C] turns on to release the tray lock lever so that the left tray separates from the right tray. Therefore, only the left tray is pulled out to load paper.
When drawing out the tandem tray fully, the projection [D] pushes up the left tray lock lever [A] so that both trays separate for easier paper loading.

2.7.11 PAPER SIZE DETECTION



A246D607.PCX



A246D608.WMF

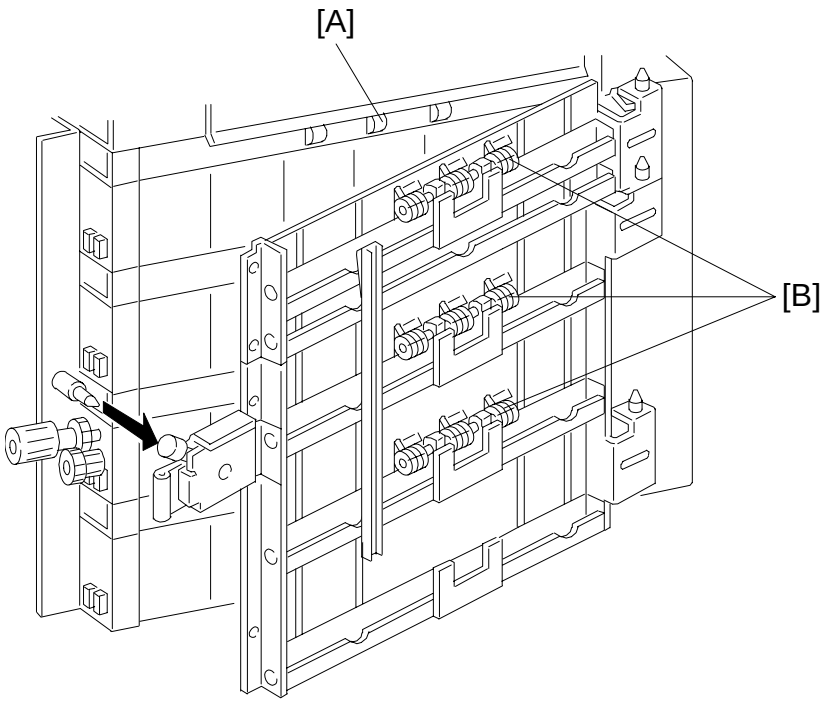
SW Actuate…..0 De-actuate…..1 (1 2 3 4 5)	Paper size	L: Lengthwise S: Sideways
	A4/A3 version	LT/DLT version
01111	A3-L	11 x 17-L
00111	B4-L	8 1/2 x 14-L
10011	A4-L	8 1/2 x 11-L
01001	A4-S	8 1/2 x 11-S
00100	8 1/2 x 13	5 1/2 x 8 1/2-S
00010	—	8 x 10-S
00001	A5-S	8 x 10-L
10000	8 k-L (*)	8 x 13-L
11000	16 k-L (*)	10 x 14-L
11100	16 k-S (*)	11 x 15-L

For the first and the third feed trays, the paper size is stored by using the SP mode (SP4-3 Tray Paper Size).

For the second feed tray (universal tray), the paper size switch [A] detects the paper size. The paper size switch has five microswitches inside. An actuator plate [B] located on the rear of the tray actuates the paper size switch. Each paper size has its own unique combination as shown in the table and the CPU judges the paper size by this combination of activated switches.

(*) It is necessary to set the Taiwanese paper size enable (SP4-12-2).

2.7.12 VERTICAL TRANSPORT MECHANISM

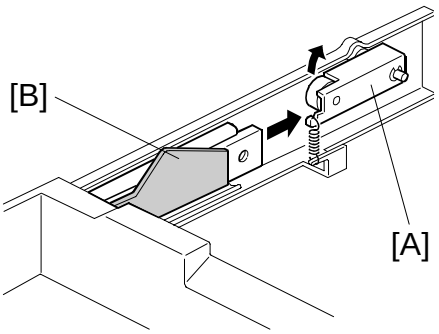


A246D610.WMF

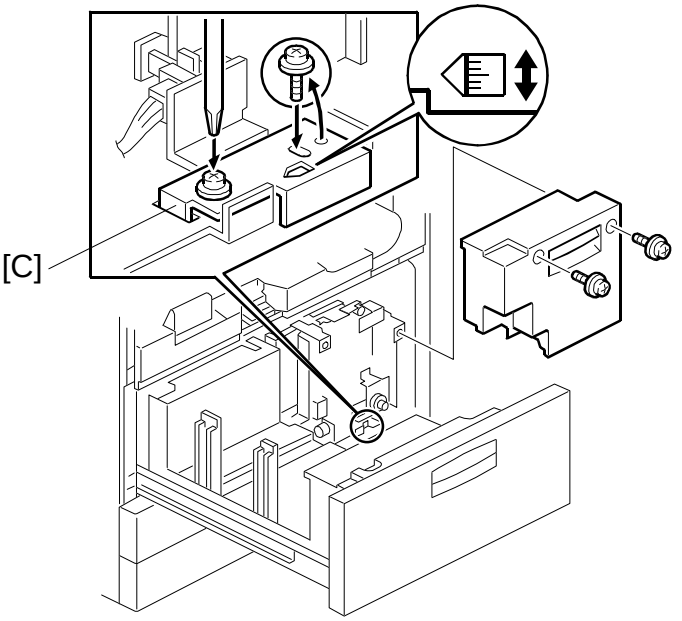
The paper feed motor drives the vertical transport rollers [A] in each feed unit. The vertical transport rollers and the idle vertical transport rollers [B], on the inner and the outer vertical guide plates, transport the paper from each feed unit to the registration roller.

The vertical transport guides can be opened to remove jammed paper in the vertical transport area.

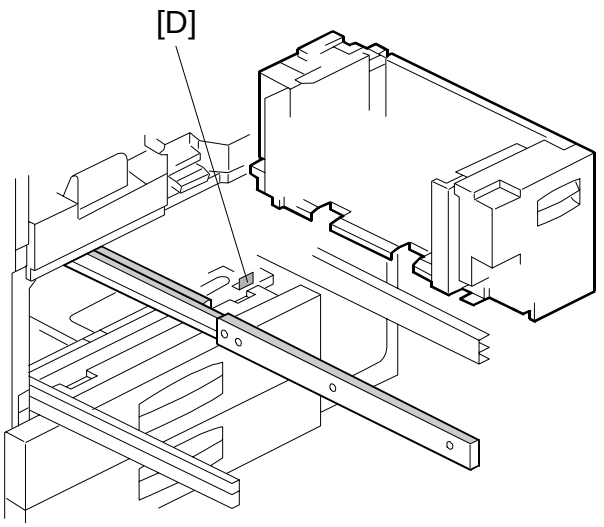
2.7.13 TRAY POSITIONING MECHANISM



A246D655.WMF



A246D656.WMF



A246D612.WMF

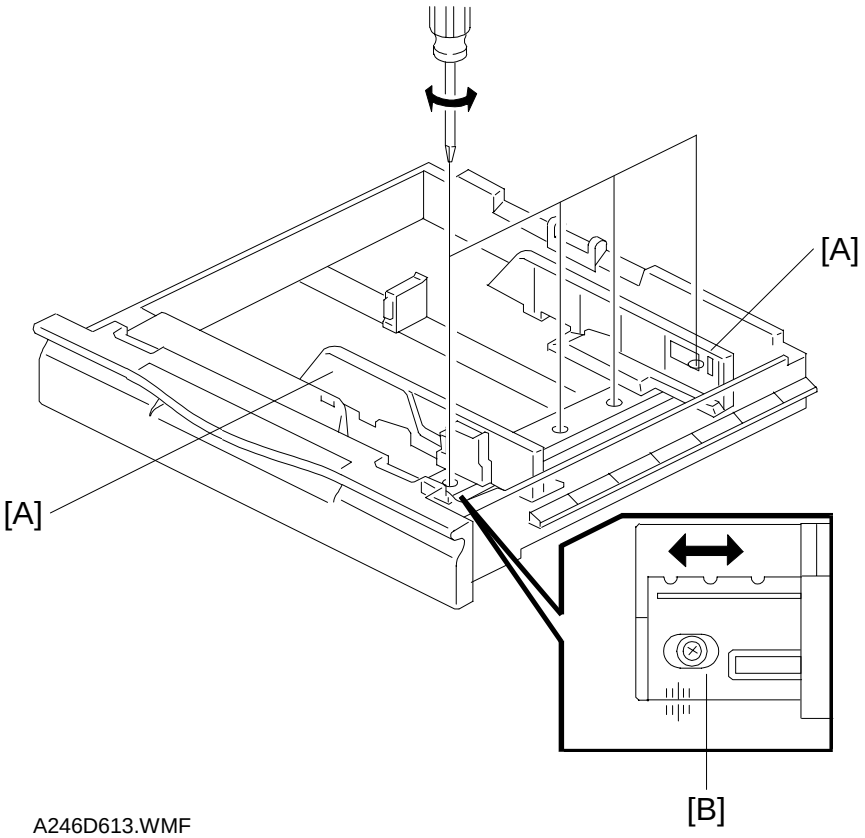
Tray Lock Mechanism

When the feed tray is set in the paper feed unit, the lock lever [A] drops behind the lock plate [B] on the Accuride support bracket to lock the tray in the proper position.

Side-To-Side Positioning Mechanism (Tandem Tray)

When the feed tray is set in the paper feed unit, the side-to-side positioning plate [C] presses the feed tray against the stopper [D]. By moving the positioning plate, the tray position can be changed to adjust the side-to-side registration.

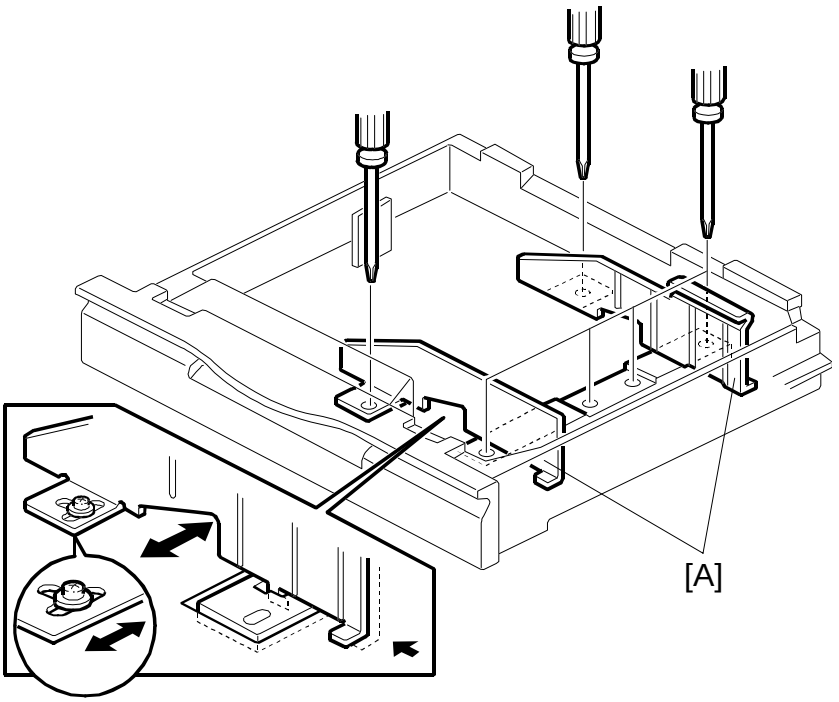
Side-To-Side Positioning Mechanism (Universal Tray)



A246D613.WMF

Side plates [A] are secured on the positioning plate [B]. By moving the positioning plate (secured by four screws), the paper position can be changed to adjust the side-to-side registration.

Side-To-Side Positioning Mechanism (550 Sheets Tray)

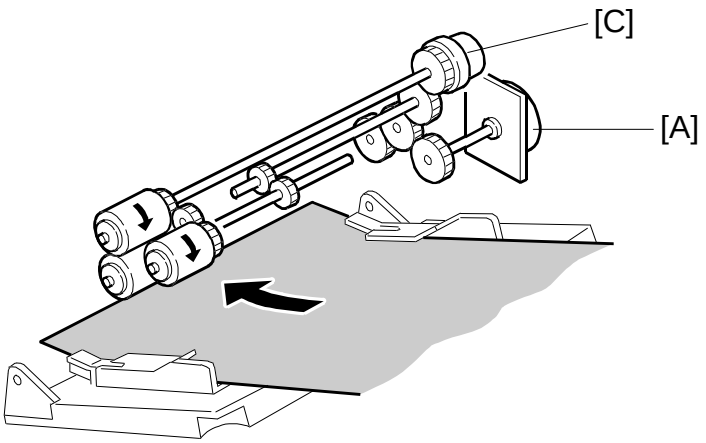


A246D657.WMF

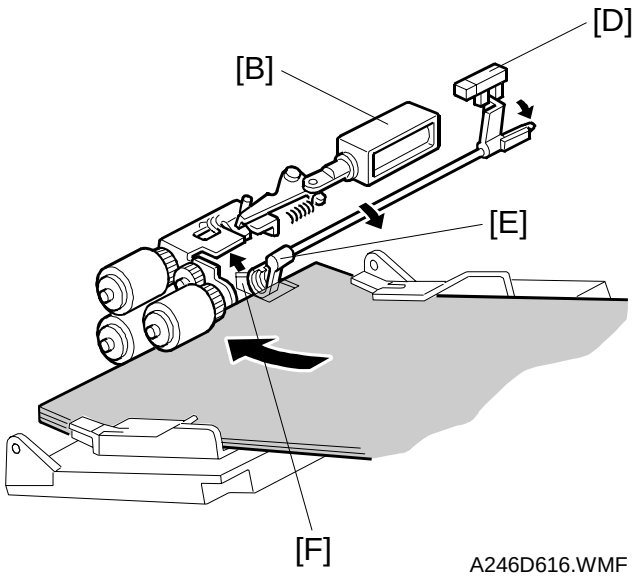
By moving the side fences [A] (secured by one screw each), the paper position can be changed to adjust the side-to-side registration.

2.7.14 BY-PASS FEED TABLE

Feed Mechanism/Paper End Detection



A246D617.WMF



A246D616.WMF

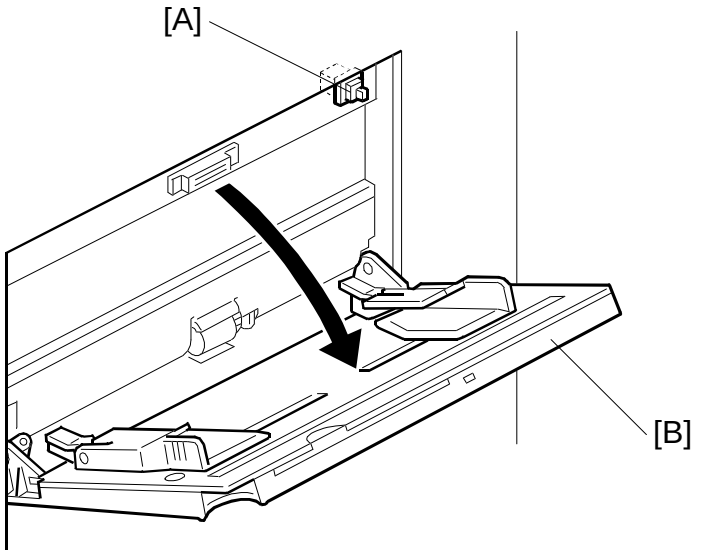
The by-pass feed table uses the FRR feed system. The by-pass feed motor [A], pick-up solenoid [B], and by-pass feed clutch [C] control paper feeding from the by-pass feed table.

The by-pass paper end sensor [D] detects if there is paper on the by-pass feed table.

When there is no paper on the by-pass feed table, the paper end feeler [E] drops in the cut out [F] of the lower guide plate and the paper end sensor [D] deactivates. When paper is present on the by-pass feed table, the paper pushes up the end feeler [E] to activate the paper end sensor [D]. The CPU turns off the paper end indicator on the LCD panel and turns the start key from red to green.

When the by-pass paper feed key is pressed twice, the copier enter the thick paper mode. In this mode the by-pass feed clutch turns on twice, and the continuous copy speed is reduced.

Table Open/Close Detection

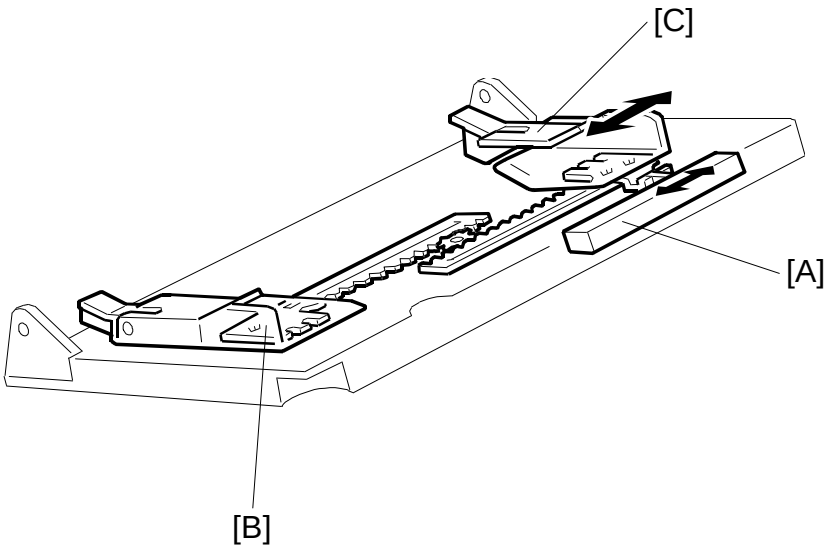


A246D618.WMF

After opening the by-pass feed table, part of the feed table [B] activates the by-pass table switch [A]. Then the CPU turns on the by-pass feed indicator on the operation panel.

On this model, opening the by-pass feed table does not shift the copier into interrupt mode. The selected modes and input data before opening the by-pass feed table remain. In addition, other paper trays can be selected while the by-pass feed table is open.

Paper Size Detection



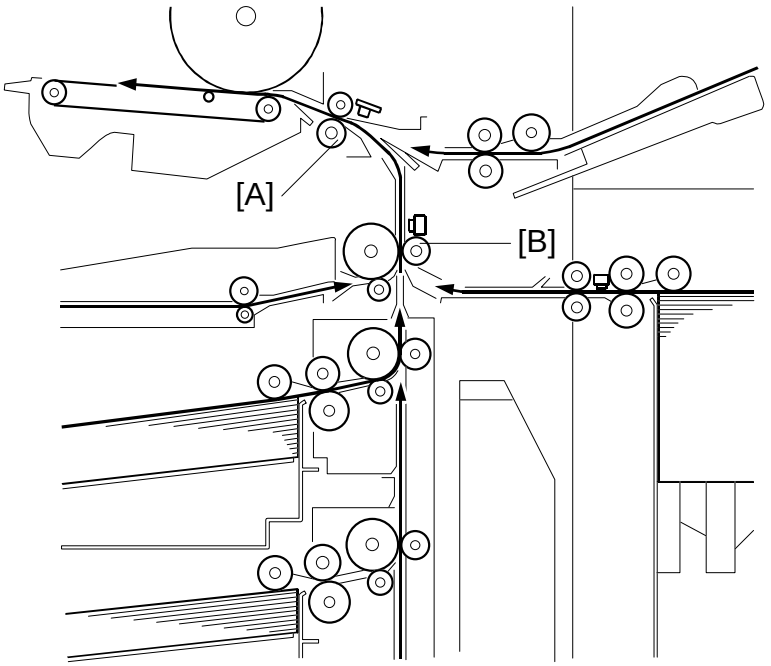
A246D619.WMF

The paper width detection is necessary to decide the lens horizontal position because the standard position of the optics (rear left corner) and the paper (center) is different.

The by-pass paper-size sensor [A] (variable resistor) monitors the paper width. When the paper side fences [B] and [C] are positioned according to the paper width, the rear side fence is connected to the lever of the by-pass paper-size sensor. The electrical resistance of the sensor changes in accordance with the side fence position. This informs the CPU of the paper width.

At the first copy from the by-pass feed table, the scanner makes a full distance scan. The registration sensor monitors the length of this paper (between the ON timing by the leading edge and the OFF timing by the trailing edge). From the following copies, the copier is controlled according to this paper length data.

2.7.15 PAPER REGISTRATION



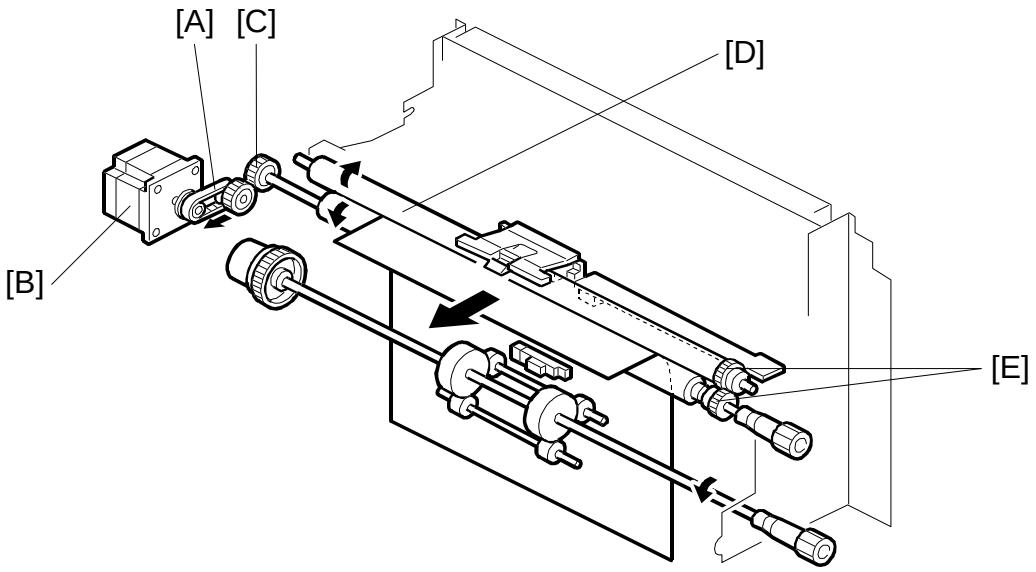
A246D620.WMF

The registration rollers [A] have two functions. One is aligning the lead edge of the paper with the leading edge of the latent image on the OPC drum. When the CPU receives the signal from the registration sensor, the registration clutch turns on. It turns off 90ms after the registration sensor detects the trailing edge of the paper.

The other function is to correct skewing of paper fed from the trays. When the leading edge of the paper reaches the registration rollers, the vertical transport rollers [B] continuously turn to transport the paper. On the other hand, the registration roller is not turning. The leading edge of the paper is pushed against the registration roller. This makes a little buckle on the paper between the vertical transport rollers and the registration rollers to correct paper skew.

Shortly after the leading edge of the paper reaches the registration roller, the registration motor rotates the registration rollers to feed the paper.

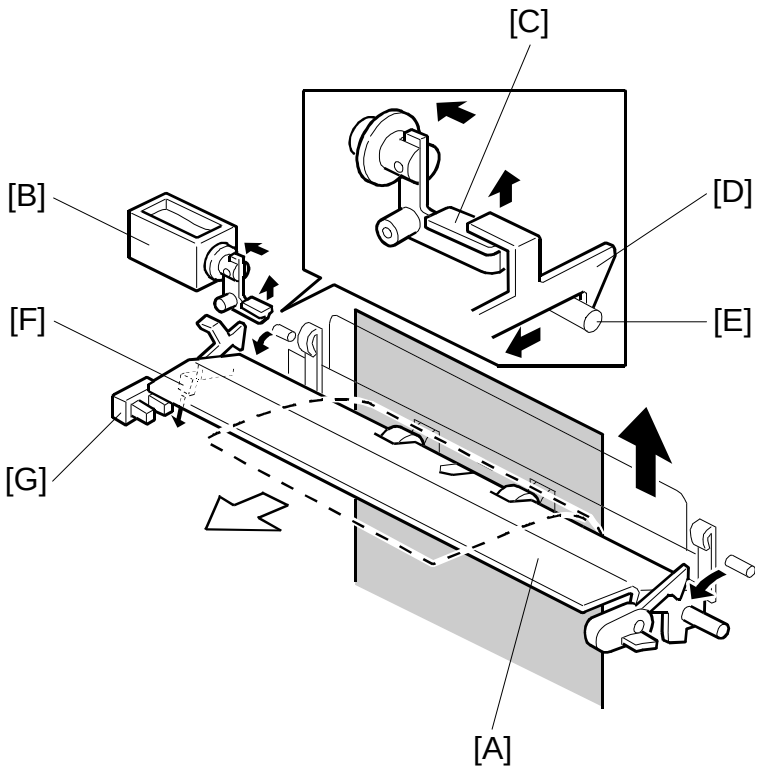
2.7.16 REGISTRATION DRIVE MECHANISM



A246D621.WMF

Through the timing belt [A], registration motor [B] drive is transmitted to the lower registration gear [C], then to the upper registration roller [D] via two gears [E] at the front side.

2.7.17 GUIDE PLATE RELEASE MECHANISM



A246D623.WMF

When a paper miss-feed occurs between the vertical transport rollers and the registration rollers, the lower paper guide plate [A] automatically opens.

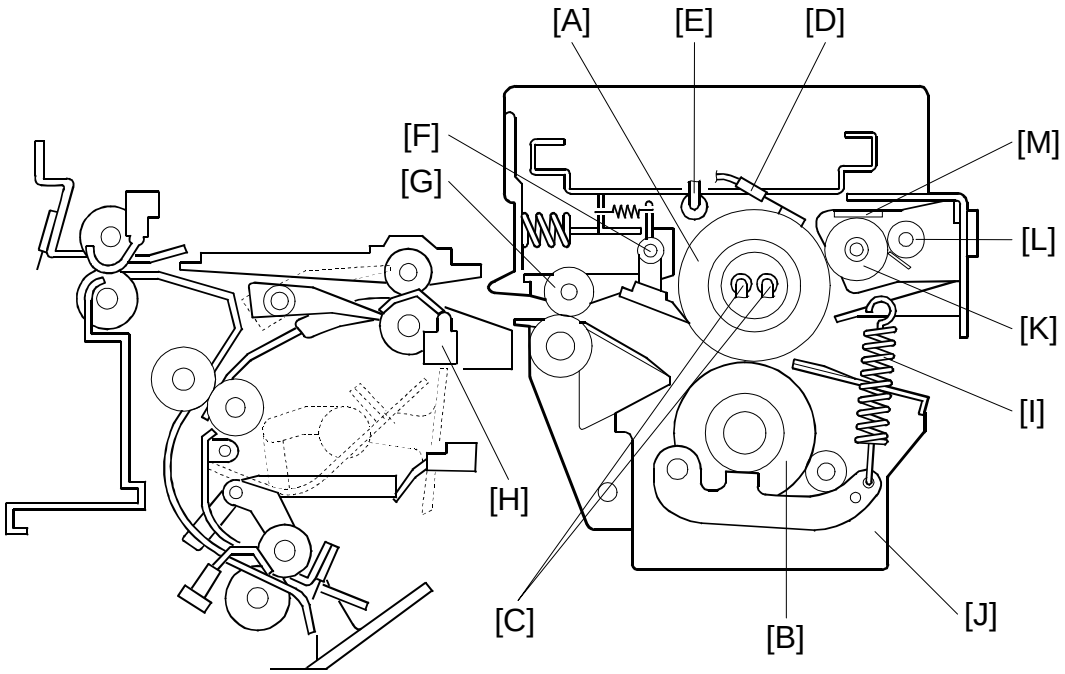
If the registration sensor is not active at a certain jam check timing, the guide plate solenoid [B] turns on. The lever [C] raises the lock lever [D] on the guide plate to release the pin [E] on the rear side frame. Then, the guide plate falls open.

The actuator [F] on the guide plate activates the guide plate position sensor [G] when the guide plate opens.

To prevent the guide plate from remaining open, if the guide plate position sensor is activated, copying will not occur and the LCD panel will display a caution message.

2.8 IMAGE FUSING

2.8.1 OVERVIEW



A246D624.WMF

After transferring the image, the copy paper enters the fusing unit. A heat and pressure process using a hot roller [A] and a pressure roller [B] fuses the image to the copy paper.

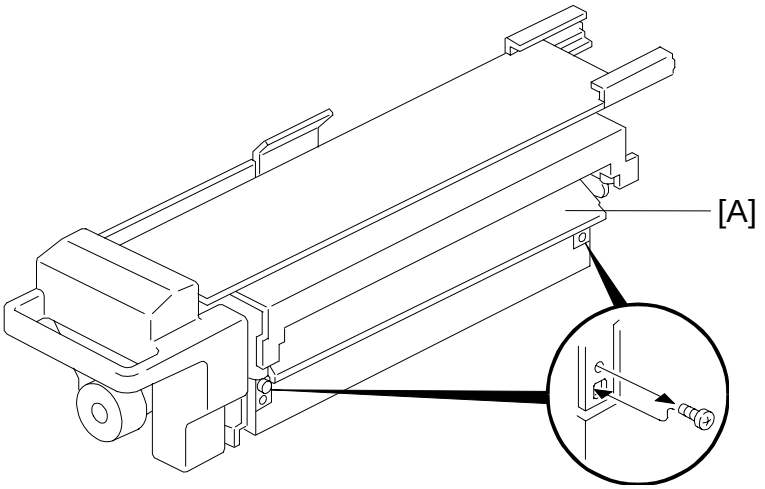
There are two fusing lamps [C] inside the hot roller. They are turned on and off to maintain the operating temperature of 185°C. The CPU monitors the hot roller surface temperature through a thermistor [D], which is in contact with the hot roller's surface. A thermofuse [E] protects the fusing unit from overheating.

The hot roller strippers [F] separate the copy paper from the hot roller and direct it to the fusing exit rollers [G]. The exit sensor [H] monitors the progress of the copy paper through the fusing unit and acts as a miss-feed detector while the exit rollers drive the copy paper to the inverter section.

The hook positions of the tension springs [I] on the pressure lever [J] adjust the roller pressure.

The oil supply roller [K] applies a light coat of silicon oil to the hot roller. The oil supply cleaning roller [L] and oil supply cleaning brush [M] remove the paper dust accumulated on the oil supply roller.

2.8.2 FUSING ENTRANCE GUIDE



A246D625.WMF

The entrance guide [A] for this machine is adjustable for thick or thin paper by changing the screw position from the upper to the lower.

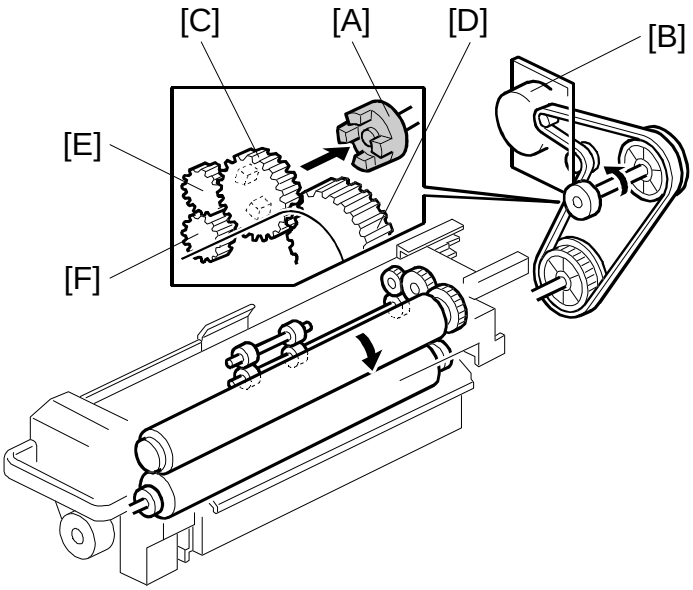
With thin paper, set the entrance guide in the upper position. This slightly lengthens the paper path, which prevents the paper from creasing in the fusing unit. With thick paper, set the entrance guide in the lower position.

This is because thick paper does not bend as easily, and is therefore less prone to creasing. In addition, the lower setting allows more direct access to the gap between the hot and pressure rollers. This prevents thick paper from buckling against the hot roller, which can cause blurring at the leading edge of the copy.

In this model, the transfer belt improves paper transport and stabilizes the paper path to the fusing entrance. This reduces the chance of paper creasing due to paper skews in the fusing unit.

Therefore, the screws secure the guide plate. Since there are very few reasons to change the guide plate position, there is no guide plate position adjustment lever for customer use.

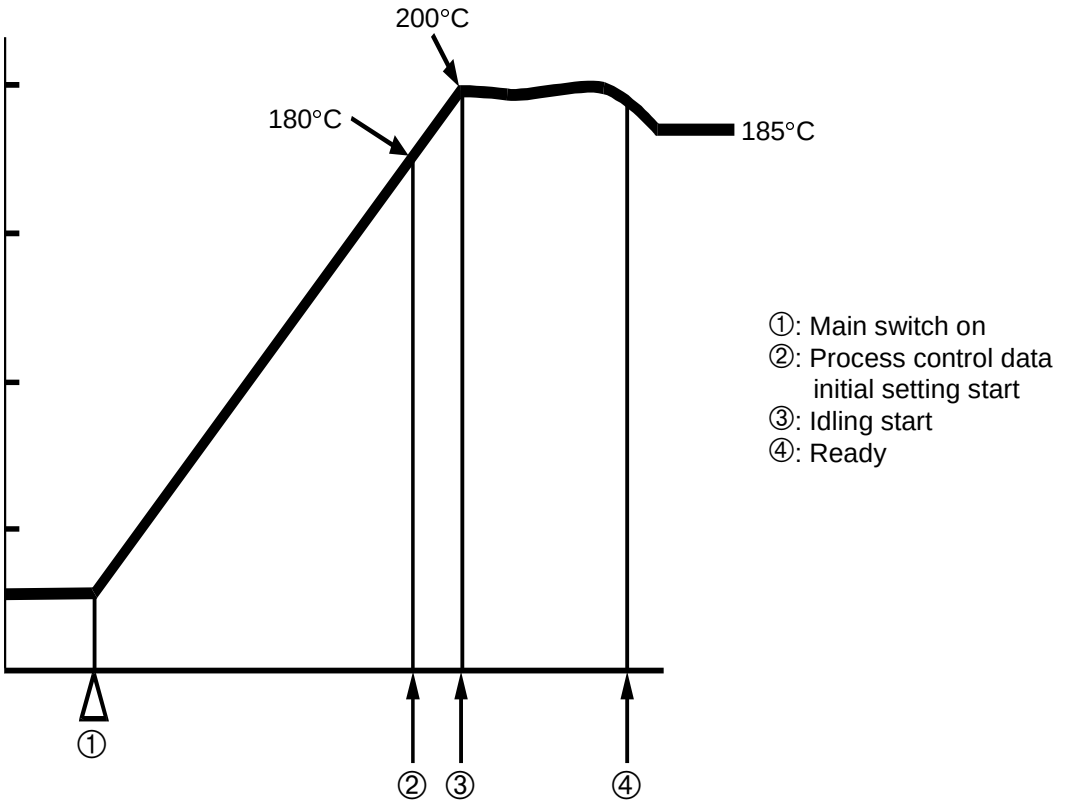
2.8.3 FUSING DRIVE MECHANISM



A246D626.WMF

The fusing drive gear [A] transmits drive from the fusing/duplex drive motor [B] to the gear [C], which drives the hot roller gear [D]. Rotation passes from the gear [C] through the idle gear [E] to the exit roller drive gear [F]. The friction between the hot and pressure rollers drives the pressure roller.

2.8.4 FUSING LAMP CONTROL



A246D627.WMF

After turning the main switch on, the CPU turns on the two fusing lamps.

When the fusing temperature reaches 180°C, the machine starts the process control data initialization. If the fusing temperature was already above 100°C when the main switch was turned on, the process control initial setting is not done.

When the CPU detects a fusing temperature of 200°C, the copier starts fusing idling. SP mode 1-15-1 can adjust the idling period. If the fusing temperature was already above 100°C after turning the machine on, it will not go into fusing idling mode.

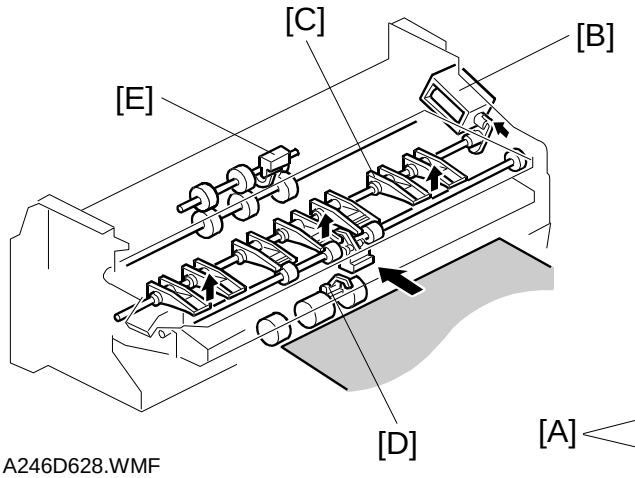
When fusing idling has finished, the warm-up period is completed and the Ready indicator turns on. After this, the machine maintains a fusing temperature of 185°C.

The CPU changes the fusing lamp ON period depending on the temperature measured by the thermistor to keep the fusing temperature as close as possible to the target temperature.

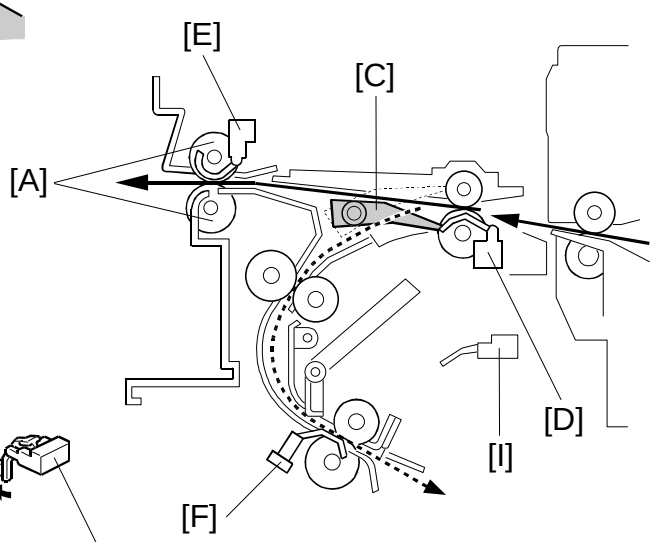
The on-off control mode controls the fusing temperature.

After pressing the by-pass paper feed key twice, the copier enters thick paper mode. In this mode, the fusing temperature stays at 190°C reducing the continuous copy speed.

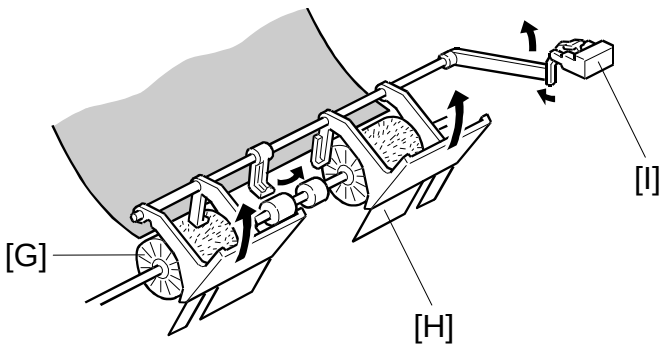
2.8.5 INVERTER AND PAPER EXIT



A246D628.WMF



A246D629.WMF



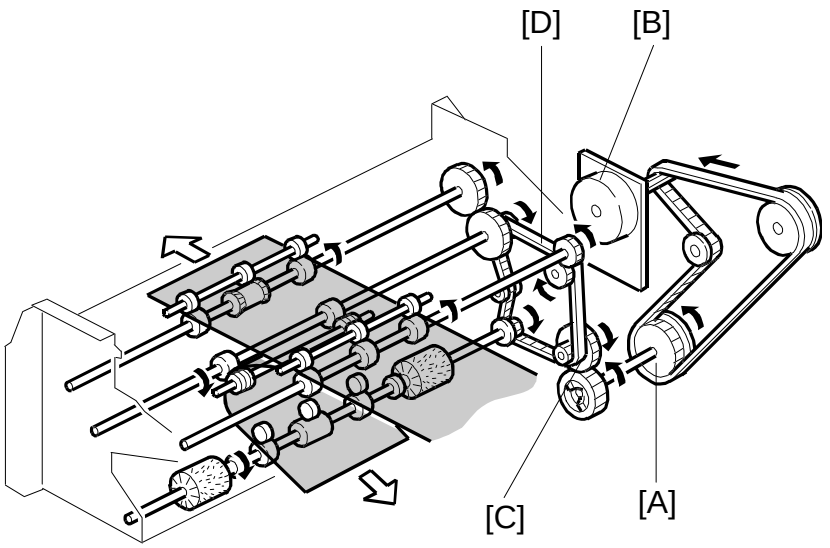
A246D658.WMF

After passing the fusing unit, copies enter the inverter unit where paper is distributed to the paper exit rollers [A] or the duplex unit. The junction gate solenoid [B] changes the position of the junction gate [C]. In duplex mode, the junction gate solenoid turns on to raise the junction gate so that the junction gate guides the paper into the duplex unit. The fusing exit sensor [D] and exit sensor [E] monitor paper miss-feeds.

The duplex transport sensor [F] not only monitors paper miss-feed detection, but also activates the duplex jogger motor.

When the paper passes the duplex transport roller [G], the paper pushes the paper guide [H] up, and the actuator on the rear end of the paper guide shaft de-activates the paper guide sensor [I]. The duplex paper guide sensor monitors paper miss-feeds.

2.8.6 INVERTER AND EXIT DRIVE MECHANISM

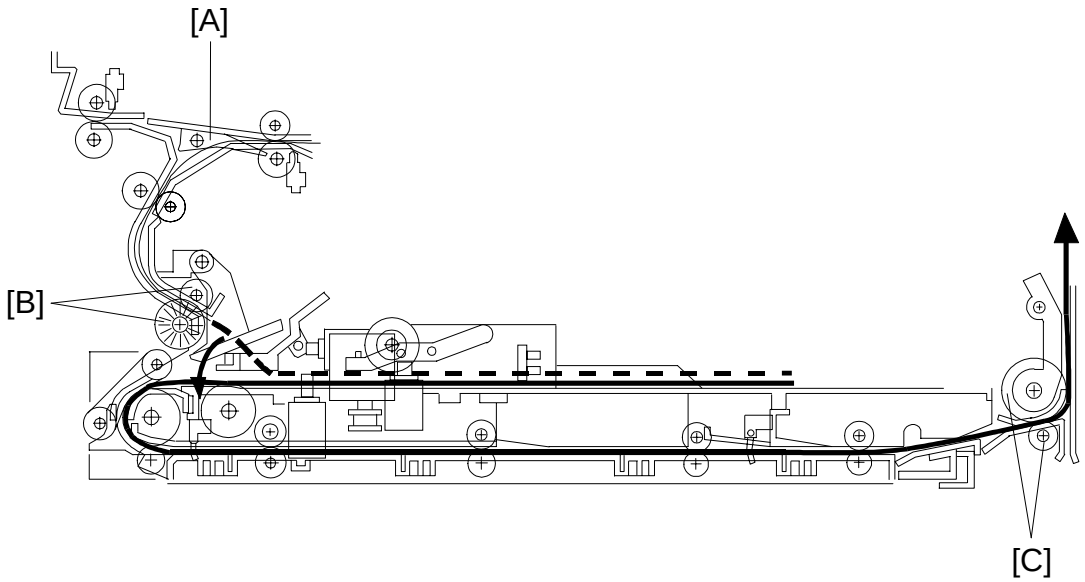


A246D630.WMF

The gear [A] transmits the drive from the fusing/duplex drive motor [B] to the next gear [C]. This gear [C] transmits the drive to the paper exit and the inverter section through the timing belt [D].

2.9 DUPLEX

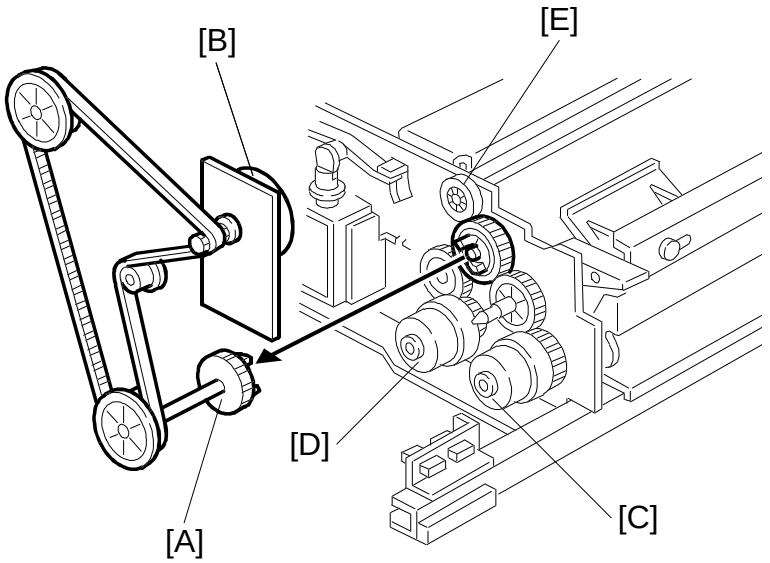
2.9.1 OVERVIEW



A246D631.WMF

In this mode, the junction gate [A] directs sheets exiting the fusing unit to the duplex tray entrance. After that, all sheets follow the path through the entrance rollers [B]. After all the front side copying is complete, the sheets follow (sheets in the duplex tray feed in order from bottom to top) the path through the duplex feed mechanism and vertical transport rollers [C] to the registration rollers.

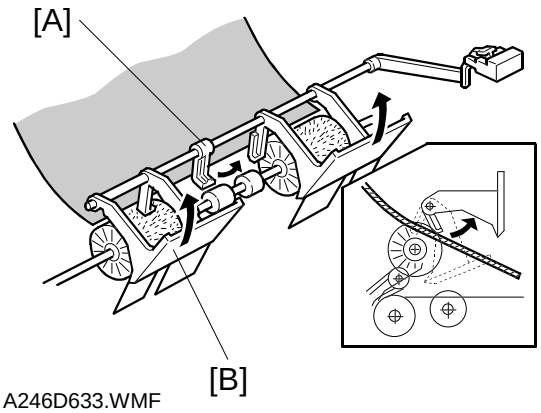
2.9.2 DRIVE MECHANISM



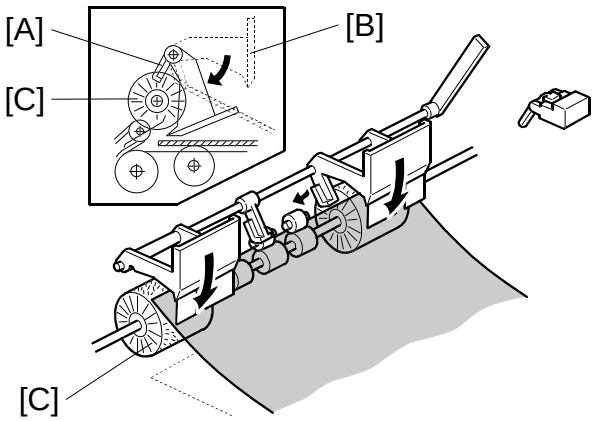
A246D632.WMF

The duplex drive gear [A] transmits drive from the fusing/duplex drive motor [B] to the duplex unit. This drive is transmitted to the duplex paper feed section under the control of the duplex feed clutch [C]. It is also transmitted to the duplex transport section under the control of the duplex transport clutch [D]. The gear [E] drives the duplex pick-up roller, so this roller continuously rotates while the fusing/duplex drive motor is on.

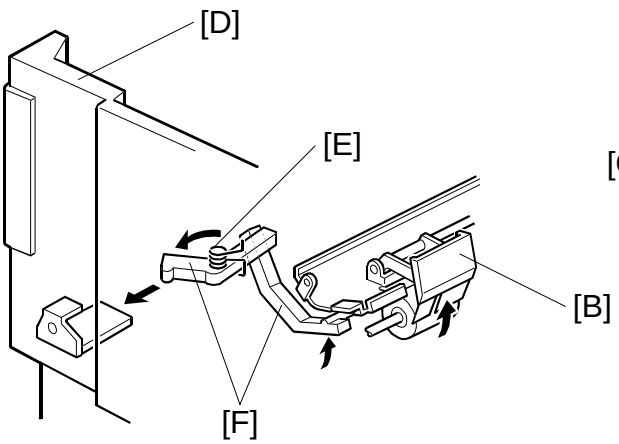
2.9.3 DUPLEX ENTRANCE TO DUPLEX TRAY



A246D633.WMF



A246D659.WMF

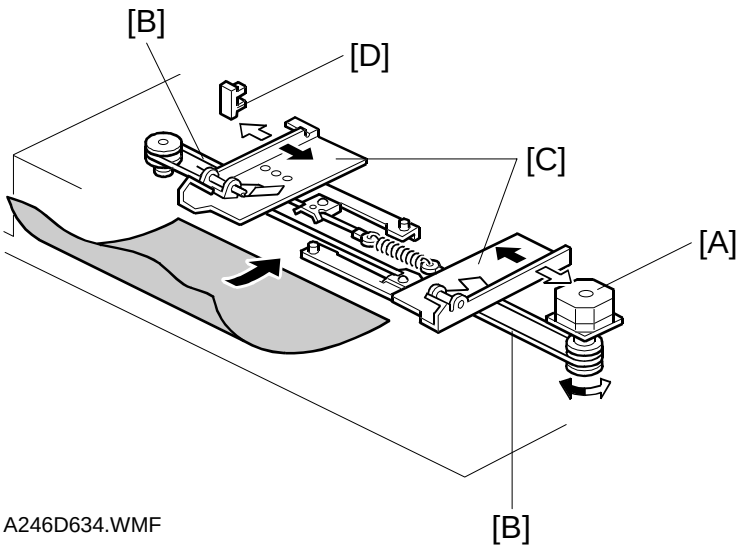


A246D660.WMF

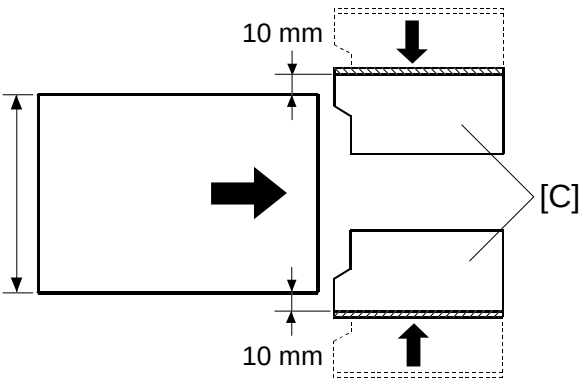
After paper passes through the junction gate, it pushes the feeler [A] up. The feeler and the paper guide [B] form one part, so that when it pushes up, the paper guide moves out of the paper path. The paper then enters the duplex unit. After the trailing edge of the paper passes the feeler, nothing holds it up and the paper guide falls into place and is ready to guide the paper under brush roller. (If the paper catches on top of the brush roller [C], the guide pushes it under as it falls.)

After opening the front door [D], the spring [E] and levers [F] lift the paper guide up so that the paper guide does not interfere with the duplex unit pulled out and pushed in for jam removal.

2.9.4 DUPLEX STACKING



A246D634.WMF



A246D635.WMF

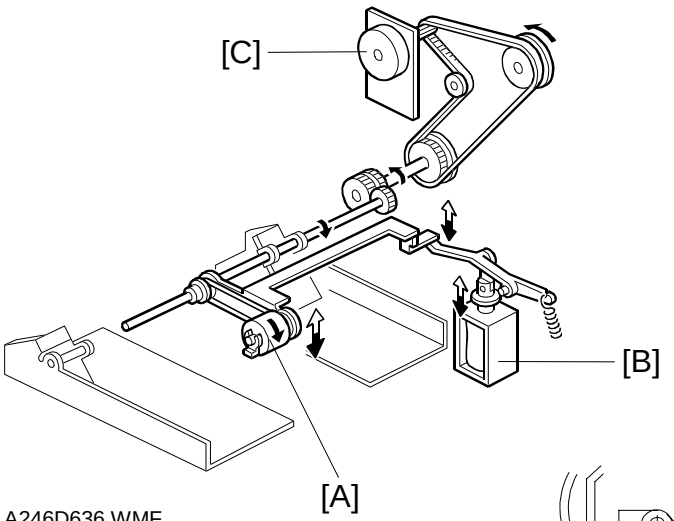
The jogger motor (stepping motor) [A] drives the side fence drive wire [B] to move the side fences [C] inward or outward.

After turning the main switch on, the jogger motor rotates to place the jogger fences at the home position by monitoring the signal of the jogger HP sensor [D].

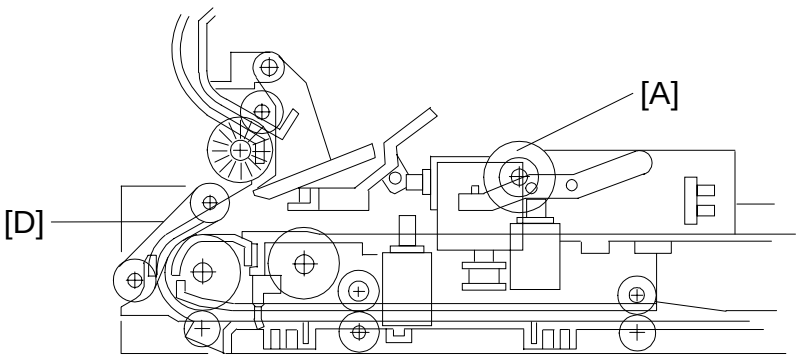
When the start key is pressed, the jogger motor rotates to position the side fences according to the selected paper size. 30 ms after the duplex transport sensor detects the leading edge of the paper (OFF → ON), the jogger motor rotates to position the jogger side fences 10 mm away from the selected paper size. When the copy paper is delivered in the duplex tray, actually 150 ms after the duplex transport sensor detects the trailing edge of the paper (ON → OFF), the jogger fences move inward to square the paper. 30 ms after the duplex transport sensor detects the leading edge of the next copy paper, the jogger fences move back to the previous positions (10 mm away from the paper size) again.

The jogger fences move inward to square the paper stack for every copy paper stack at the same timing as before. After the last copy of the first side that is copying enters the duplex tray, the jogger fences remain against the paper stack.

2.9.5 DUPLEX PICK-UP ROLLER MECHANISM



A246D636.WMF

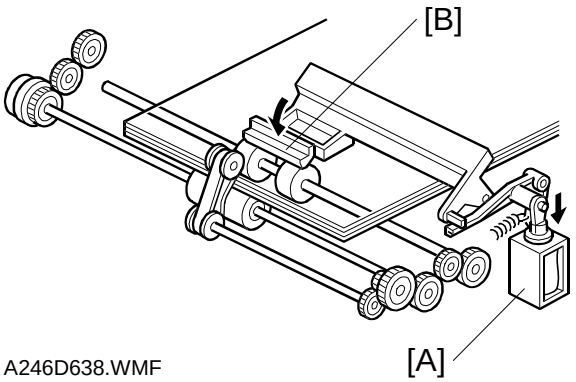


A246D637.WMF

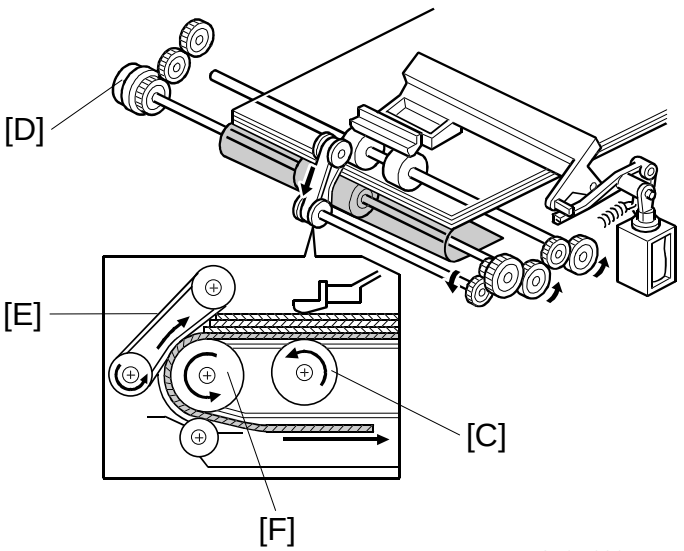
The positioning roller [A] is in the upper position. 150 ms after the duplex transport sensor detects the trailing edge of the paper (ON → OFF), the positioning solenoid [B] turns on to lower the positioning roller until it contacts the paper. The positioning roller continuously rotates clockwise while the fusing/duplex motor [C] rotates. The positioning solenoid turns on until the leading edge of the paper hits the separation belt [D].

30 ms after the duplex transport sensor detects the leading edge (OFF → ON) of the next paper, the positioning roller solenoid turns off. This raises the positioning roller so that it does not disturb the next paper as it enters.

2.9.6 DUPLEX PAPER FEED



A246D638.WMF



A246D639.WMF

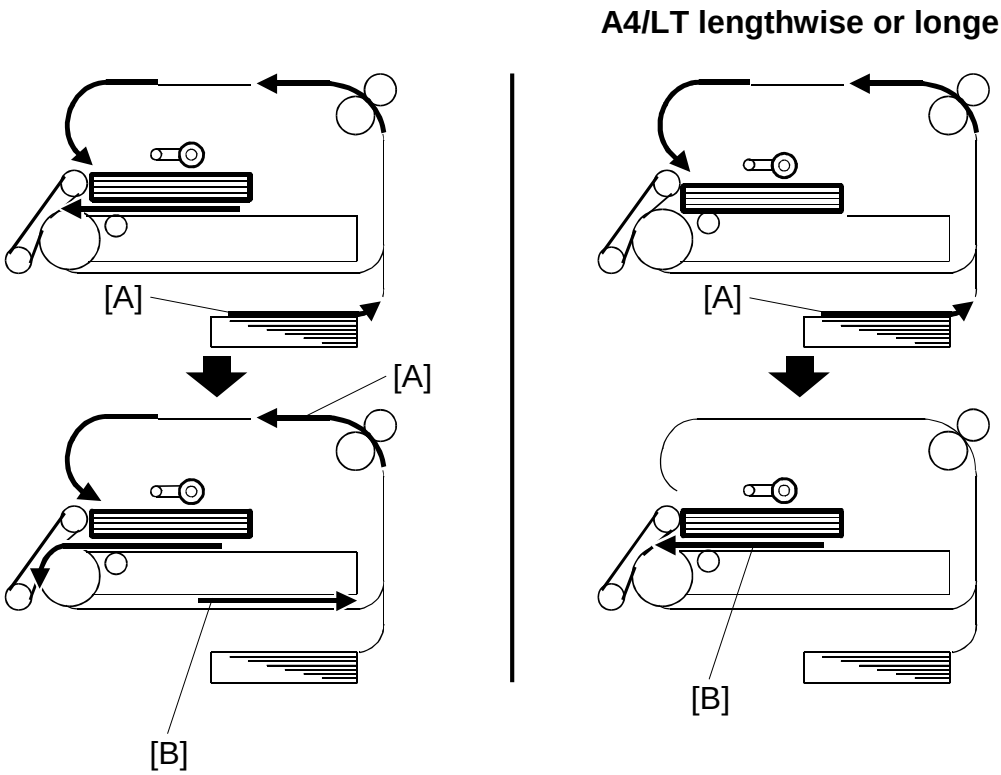
The paper in the duplex tray feeds in order from the bottom to the top sheet.

At the appropriate time, before the bottom sheet feeds, the duplex pressure solenoid [A] turns on to lower the pressure arm [B]. This causes the pressure arm to press the paper against the pick up roller [C].

Then, the paper feed clutch [D] turns on to rotate the pick-up roller [C], separation belt [E] and the feed roller [F].

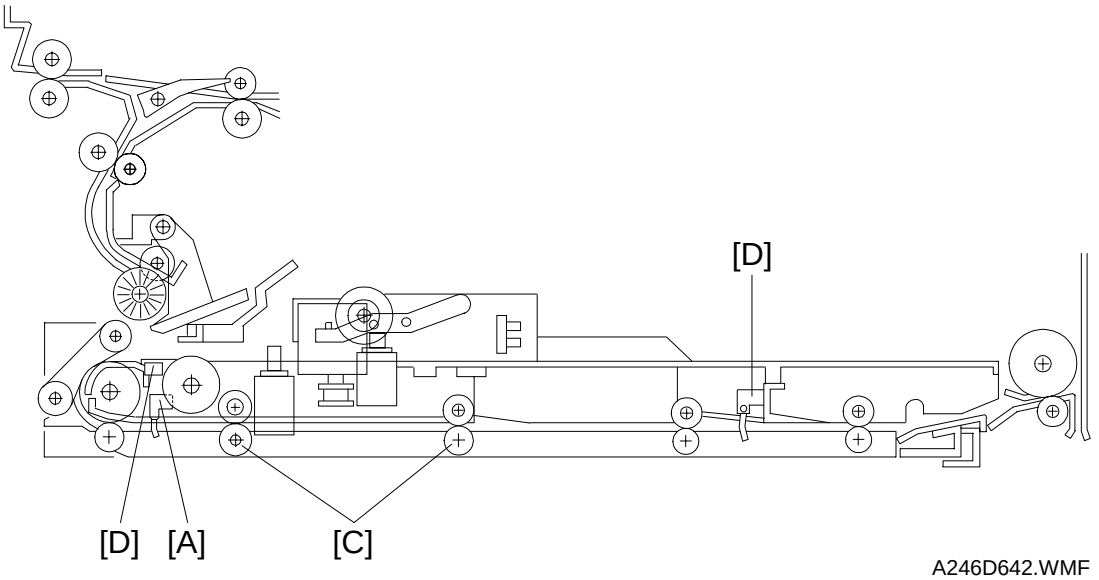
The separation belt [E] and the feed roller [F] rotate in opposite directions. Only the bottom paper feeds because the separation belt prevents any other paper from feeding.

The feed roller advances the bottom paper past the separation belts because the force of the feed roller is greater than the resistance of the separation belts. The separation belt prevents multiple feeds because the resistance of the separation belt is greater than the friction between the papers.

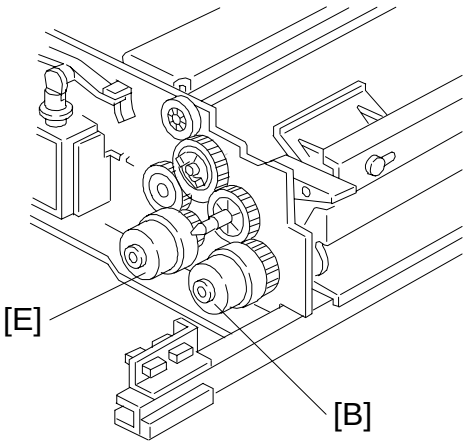


To increase duplex copy productivity from simplex to duplex mode with DF, the duplex copy control will change as follows:

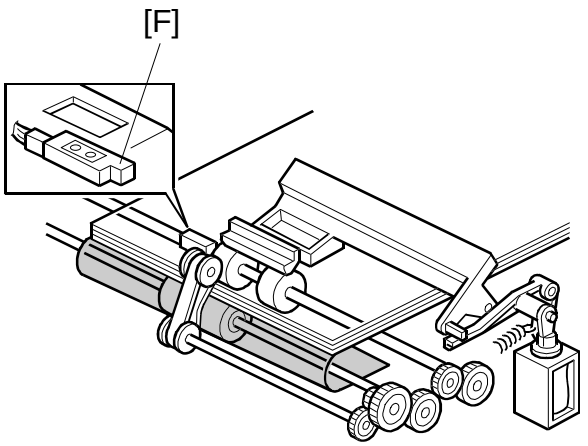
Before the last sheet [A] of copy paper is stacked in the duplex tray, the next job [B] will start from the bottom stacked sheet (Except for A4/LT Lengthwise or longer).



A246D642.WMF



A246D671.WMF



A246D641.WMF

When the duplex transport sensor detects the trailing edge of the last paper, the pressure solenoid turns off to raise the pressure arm.

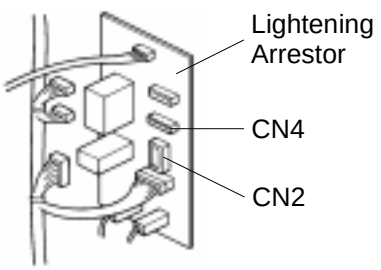
200 ms after the duplex entrance sensor [A] detects the leading edge of the paper, the duplex feed clutch [B] turns off and the paper is transported by the duplex transport rollers [C].

When the paper activates the duplex exit sensor [D], the duplex transport clutch [E] turns off and the paper waits there until the feed timing adjusts to match the registration clutch timing of the previous paper.

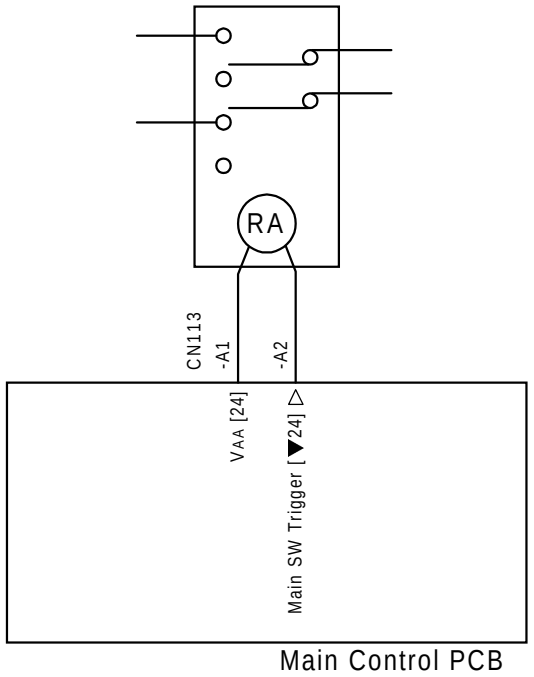
The duplex paper end sensor [F], which is a reflective type photo sensor, detects the duplex paper end condition.

2.10 ENERGY STAR COMPLIANT MACHINES (ALL THE DESTIMATIONS)

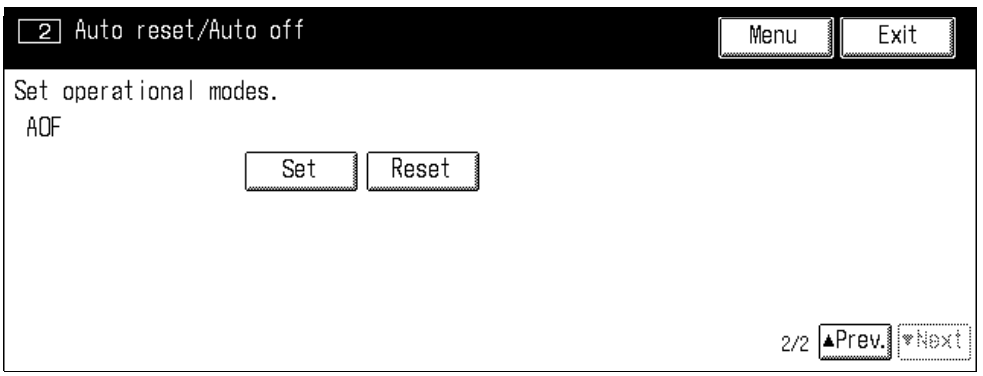
In conjunction with the modification for the Energy Star compliance, Ricoh asks that all field technicians understand the changes in operation modes to configure the machine for the customer specific environment/requirements. This section refers to all differences between the Energy Star compliant machines and other machines previously produced.

Mode	Non-Energy Star	Energy Star
Auto Off Mode	If the user utilizes the copier after the weekly timer turns it off, the copier will turn itself back off after a selected time. The auto off time can be set from 1 to 999 minutes, or turned off. Default: Off	The copier turns off after the selected time after the last copying job. The time can be adjusted from 1 to 240 minutes. Default: 90 minutes Auto Off Mode disabling (User Tools - Auto Off - 2/2 page - AOF). If Reset is selected, the machine will never enter auto off mode. In this condition (AOF: Reset), Set date/Time and Weekly Timer touch displays will appear on the User Tools/Counter menu.
Low Power Mode	The copier enters Low Power Mode automatically at the selected time after your job is finished. The time can be set from 1 to 999 minutes or turned off.	The copier enters Low Power Mode automatically at the selected time after your job is finished. The time can be adjusted from 1 to 240 minutes. Default: 15 minutes
Simplex/Duplex Mode	Single sided original to single sided copy is default setting mode at the factory.	Single sided original to two-sided copy is default setting mode at the factory. Note: Program #10, which the copier refers to at initialization, holds the mode.
Weekly Timer	Available	Because the auto off mode is a mandatory standard feature of the Energy Star standards, the weekly timer is no longer available.
Anti-condensation heaters	All plugged in	All unplugged. (CN2 and 4 on the lightening arrestor PCB)  Note: All anti-condensation heaters are still on the machine.

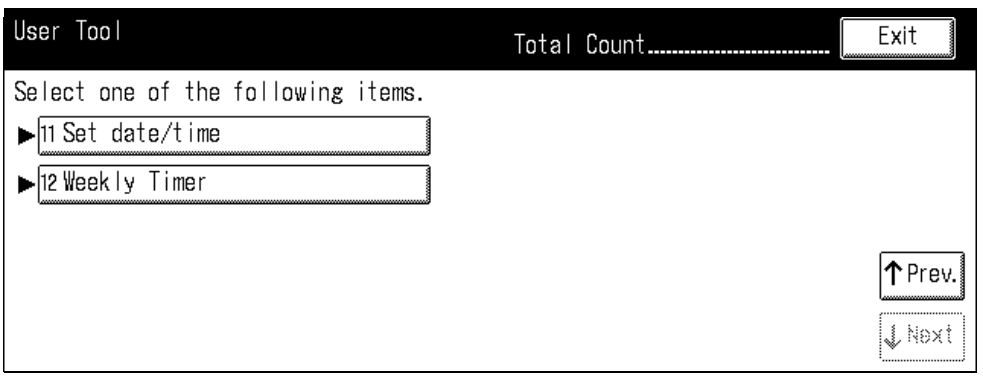
Because the attached “Energy Star Information” will be available together with the Operating Instructions, make sure that the customer understands how the machine operates to save energy.



A246D665.PCX



A246D666.PCX



A246D667.PCX

2.11 ENERGY SAVING INFORMATION

As an Energy Star Partner, we have determined that this copier model meets Energy Star Guidelines for energy efficiency.

This product was designed to reduce the environmental impact associated with copying equipment by means of energy saving feature such as Auto off, Low power, duplex default modes.

2.11.1 ABOUT THE ENERGY SAVING FEATURES OF THIS COPIER

Auto Off Mode

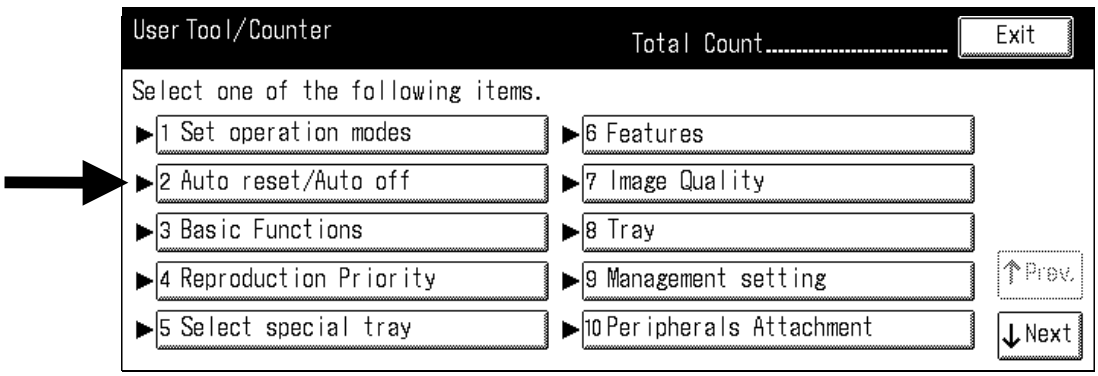
NOTE: There is an explanation of Auto Off mode in your Operating Instructions. The explanation of Auto Off mode described below is a supplement/correction of that given in your Operating Instructions.

NOTE: The Weekly Timer is not available on this copier because of the Auto Off mode.

To conserve energy, this copier model automatically turns off 90 minutes after the last copying job is complete.

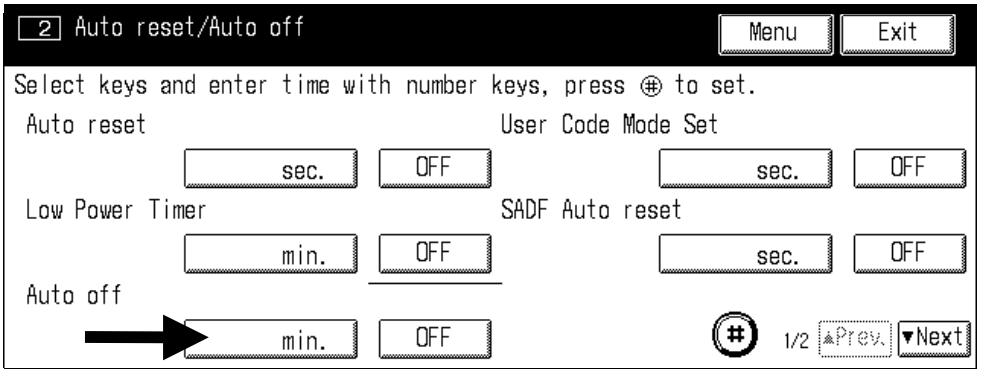
To exit the Auto Off Mode, turn on the main switch. The main switch for this copier has three positions, press it all the way and hold for 1 - 2 seconds.

Changing The Auto Off Timer



A246D672.PCX

1. Press the User **"Tools/Counter"** key.
2. Touch the **"2 Auto reset/Auto off"** key.



A246D670.PCX

3. Adjust the Auto off timer following the instructions on the display.
   - Time can be adjusted from 1 to 240 minutes in 1-minute steps.
   - You cannot cancel the Auto off mode. The **"OFF"** key cannot be selected.
4. To exit from the User Tools condition, touch the **"Exit"** key.

Low Power Mode

This copier automatically lowers its power consumption when this copier is not used for a certain period after last copy job.

To exit the low power mode, press **"Clear Mode/Energy Saver"** key.

Changing Low Power Timer

1. Access "2 Auto reset/Auto off" page in the user tools.
2. Adjust the Low power timer following the instruction on the display.
   - Time can be adjusted from 1 to 240 minutes in 1 minute steps.
   - You cannot cancel the low power mode. The **"OFF"** key cannot be selected.
3. Exit the user tools.

Duplex Default Mode (U.S.A. Version Only)

NOTE: There is an explanation of the Duplex mode in your Operating Instructions. The explanation of the Duplex mode described below is a supplement/correction of that given in your Operating Instructions.

The factory (Default) setting in Menu 10 (Set operation modes) of the User Tools has been set at "PROGRAM 10" rather than "NORMAL". This allows copy modes stored in Program 10 to be the default mode. (For detail, refer to your Operating Instruction Book.)

To save paper resources, the following Duplex mode has been selected as the factory (default) setting using Program 10:

- Copiers with the document feeder and the sorter stapler are set for two sided copies from an even number of originals.

Canceling The Duplex Default Mode

To cancel the Duplex Default mode, store one-sided copy mode in Program 10 as follows:

1. Press the **"Clear Modes"** key.
2. Touch the **"Duplex/Series Copies"** key to cancel the duplex mode.
3. Press the **"Program"** key.
4. Touch the **"Store Program"** key.
5. Touch the **"10"** key. Then, the display shows "Program 10 has been stored. Do you want to revise the program?".
6. Touch the **"Yes"** key to overwrite a new program.
7. Touch the **"10"** key again to enter a new program.

Changing Duplex Default Mode

To change a duplex mode set at the factory as a default to an another duplex mode you need as a default, select the appropriate duplex mode and overwrite it in Program 10 as follows;

1. Press the **"Clear Modes"** key.
2. Touch the "**Duplex/Series Copies"** key to cancel the duplex mode. Then, touch the **"Duplex/Series Copies"** key again and select the appropriate duplex mode as the default.
   - You can select either "Two sided copies from an odd number of originals" or "Two sided copies from two sided originals".
3. Press the **"Program"** key.
4. Touch the **"Store Program"** key.
5. Touch the **"10"** key. Then, the display shows "Program 10 has been stored. Do you want to revise the program?".
6. Touch the **"Yes"** key to overwrite a new program.
7. Touch the **"10"** key again to enter a new program.

Recycled Paper

Please contact your sales or service representative for recommended recycled paper types that this copier can use.

3. INSTALLATION PROCEDURE

3.1 INSTALLATION REQUIREMENTS

3.1.1 ENVIRONMENT

1. Temperature Range: 10°C to 30°C (50°F to 86°F)
2. Humidity Range: 15% to 90% RH
3. Ambient Illumination: Less than 1,500 lux (Do not expose to direct sunlight.)
4. Ventilation: To avoid possible build-up of ozone, make sure to locate this copier in a large well ventilated room that has an air turnover of more than 30 m^3/hr/person.
5. Ambient Dust: Less than 0.10 mg/m^3 (2.7 x 10^{-6} oz/yd^3)
6. If the place of installation is air-conditioned or heated, do not place the machine where it will be:
   1) Subjected to sudden temperature changes.
   2) Directly exposed to cool air from an air-conditioner.
   3) Directly exposed to heat from a heater.
7. Do not place the machine where it will be exposed to corrosive gases.
8. Do not install the machine at any location over 2,000 m (6,500 feet) above sea level.
9. Place the copier on a strong and level base.
10. Do not place the machine where it may be subjected to strong vibrations.

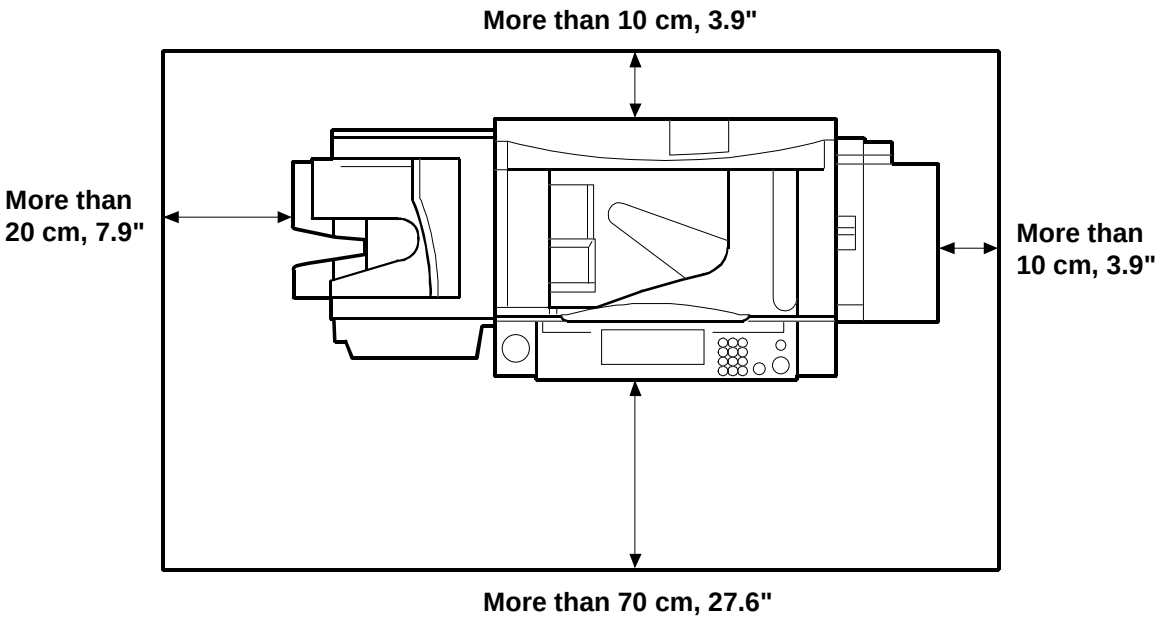
3.1.2 MACHINE LEVEL

1. Front to back: Within 5 mm (0.2") of level
2. Right to left: Within 5 mm (0.2") of level

NOTE: The machine legs may be screwed up or down in order to level the machine. Set a carpenter's level on the exposure glass.

3.1.3 MINIMUM SPACE REQUIREMENTS

Place the copier near the power source, providing clearance as shown below. The same amount of clearance is necessary when optional equipment is installed.



A246I518.WMF

3.1.4 POWER REQUIREMENTS

⚠CAUTION

1. **Make sure the plug is firmly inserted in the outlet.**
2. **Avoid multi-wiring.**
3. **Do not set anything on the power cord.**

1. Input voltage level:
   - 120 V/60 Hz: More than 20 A
   - 220 ~ 240 V/50-60 Hz: More than 10 A
   - 110 V/60 Hz: More than 20 A
2. Permissible voltage fluctuation: 10%

3.2 COPIER (A246/A247/A248)

3.2.1 ACCESSORY CHECK

Check the quantity and condition of the accessories in the box against the following list:

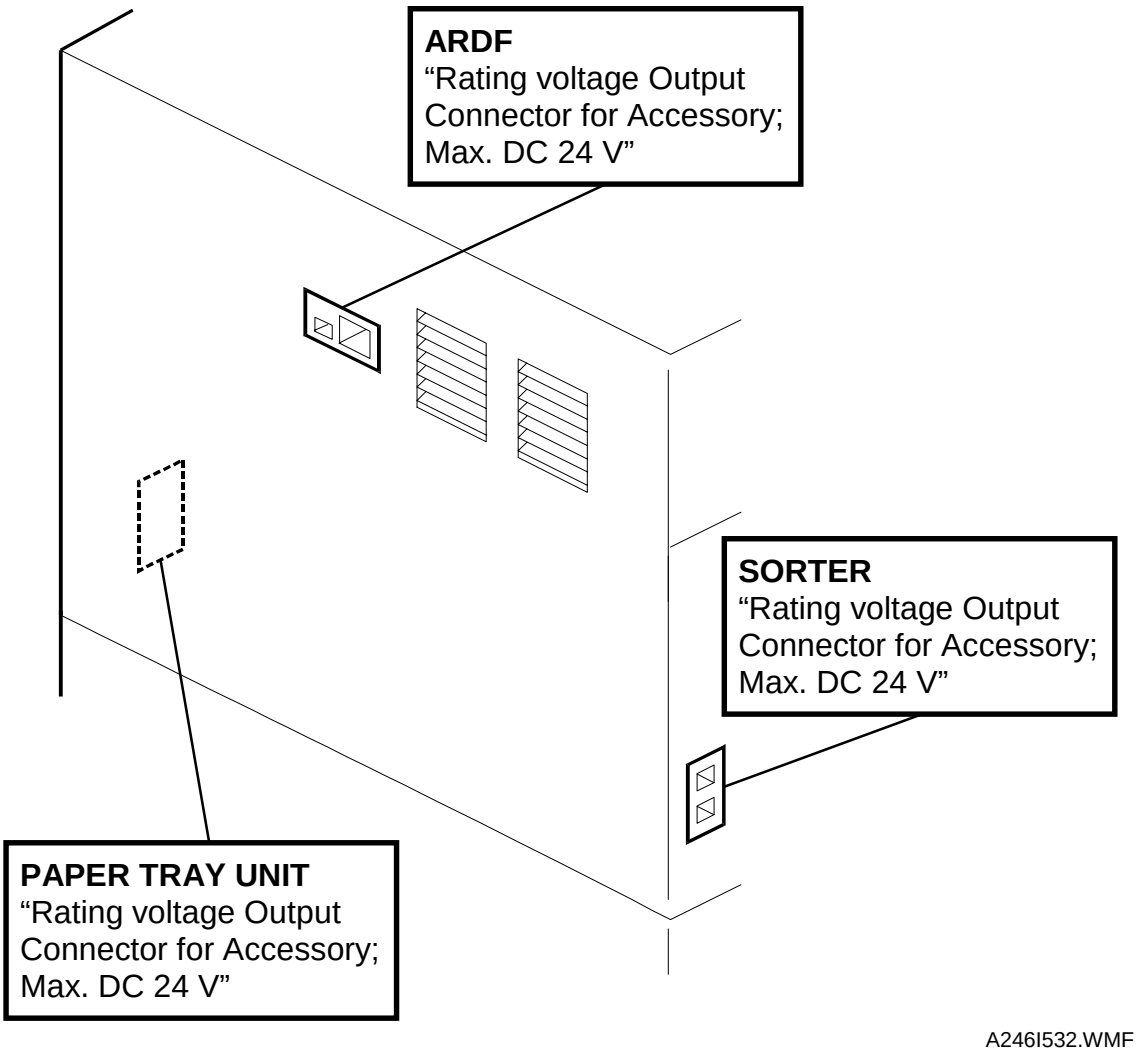
Description	Q'ty
1. Leveling Shoes	2
2. SP mode data sheet	1

3.2.2 INSTALLATION PROCEDURE

⚠CAUTION

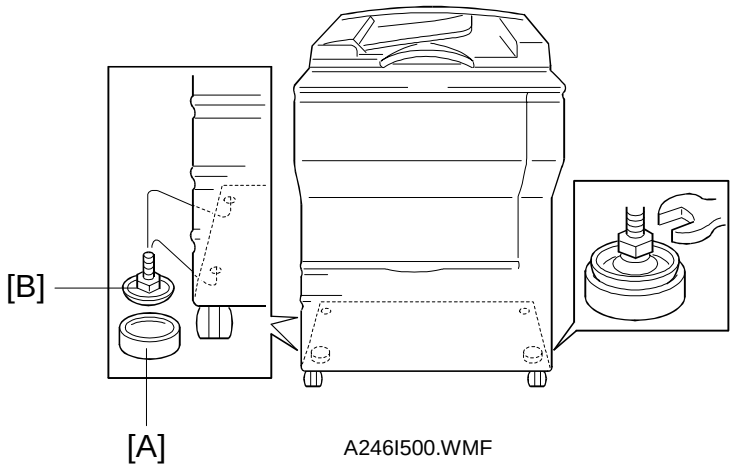
Rating voltage for Peripherals

Make sure plug the cables into the correct sockets.

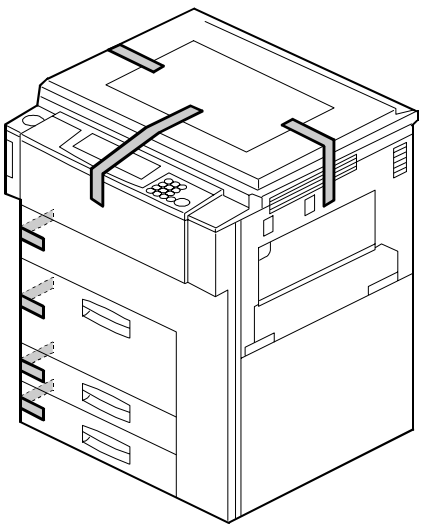

ARDF
“Rating voltage Output Connector for Accessory; Max. DC 24 V”
SORTER
“Rating voltage Output Connector for Accessory; Max. DC 24 V”
PAPER TRAY UNIT
“Rating voltage Output Connector for Accessory; Max. DC 24 V”

A246I532.WMF

NOTE: Since the installation procedure is not packed with the copier as an accessory, always bring this manual with you.



A246I500.WMF



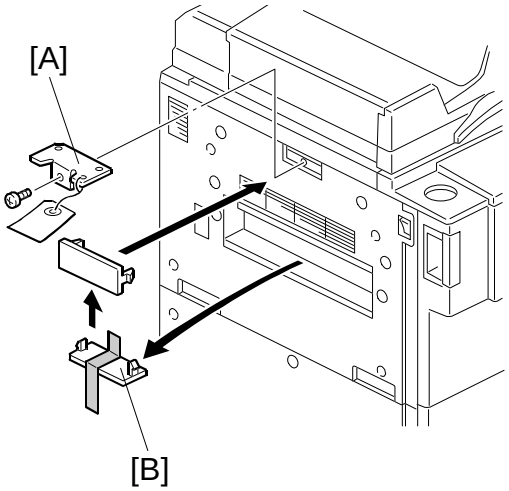
A246I510.WMF

⚠CAUTION

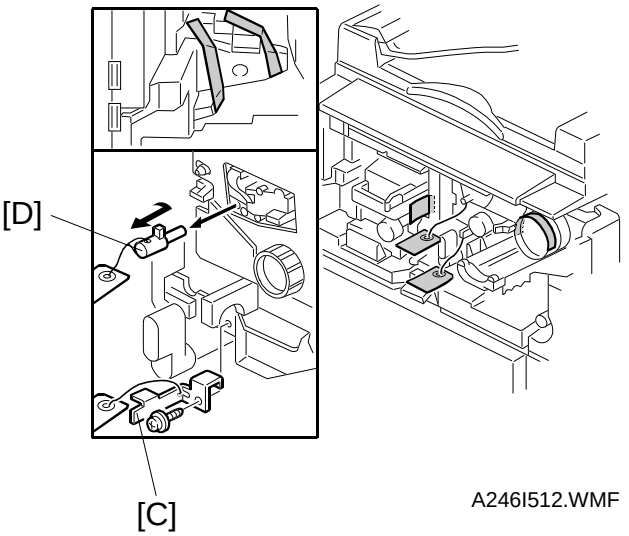
When installing the copier, make sure that the copier is unplugged.

NOTE: Insert the leveling shoes [A] under the leveling feet [B] for the front side, and level the machine before starting the installation. (The leveling feet [B] can be screwed up or down.) Extra leveling shoes (AH013008) and leveling feet (AH011004) are available as spare parts.

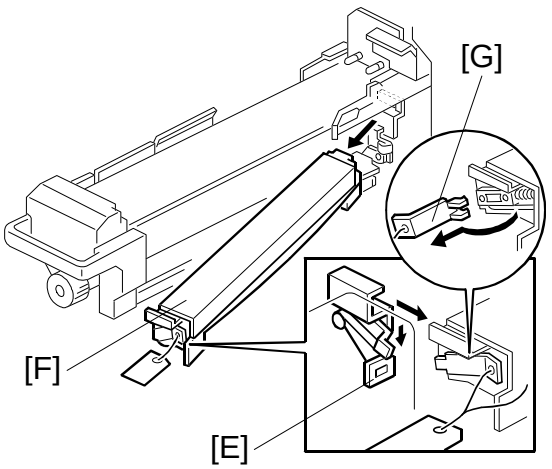
1. Remove the tape strips.



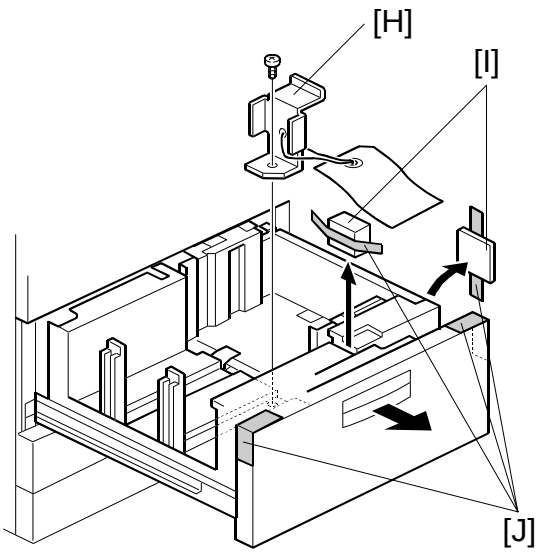
A246I511.WMF



A246I512.WMF

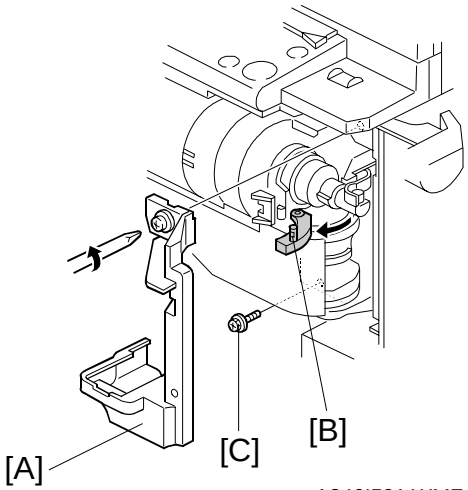


A246I513.WMF

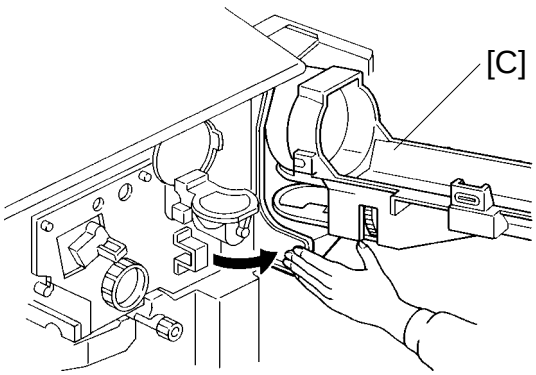


A246I537.WMF

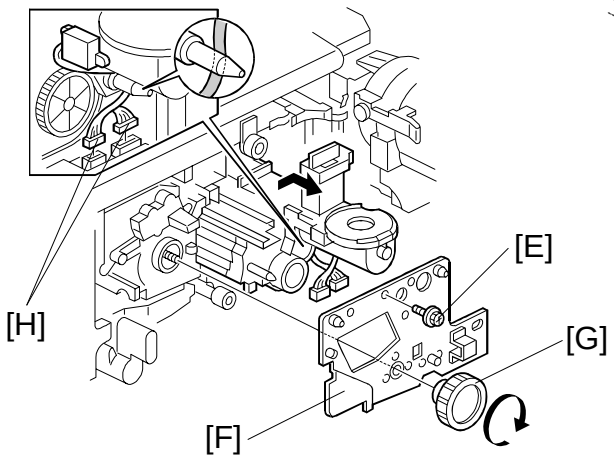
2. Open the front door.
3. Remove the tape strips.
4. Remove the scanner clamp [A] (1 screw) and install the cap [B] attached on the paper exit bracket with a tape.
5. Remove the transfer belt lock plate [C] (1 screw).
6. Turn about 180° then remove the cleaning unit lock pin [D].
7. Pull out the fusing unit. Lower the lever [E], remove the oil supply unit [F], and remove the front and rear clamps [G]. Reinstall the oil supply unit and push in the fusing unit.
8. Pull out the 1st tray. Remove the clamp [H], shipping retainers [I], and tapes [J].



A246I501.WMF

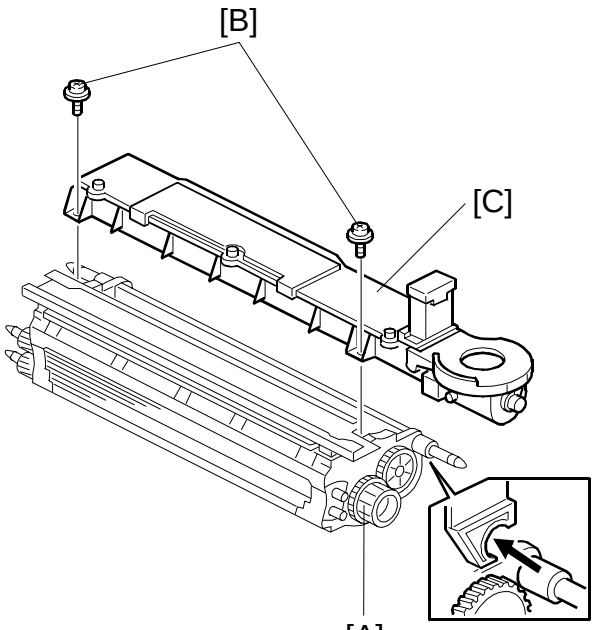


A246I514.PCX

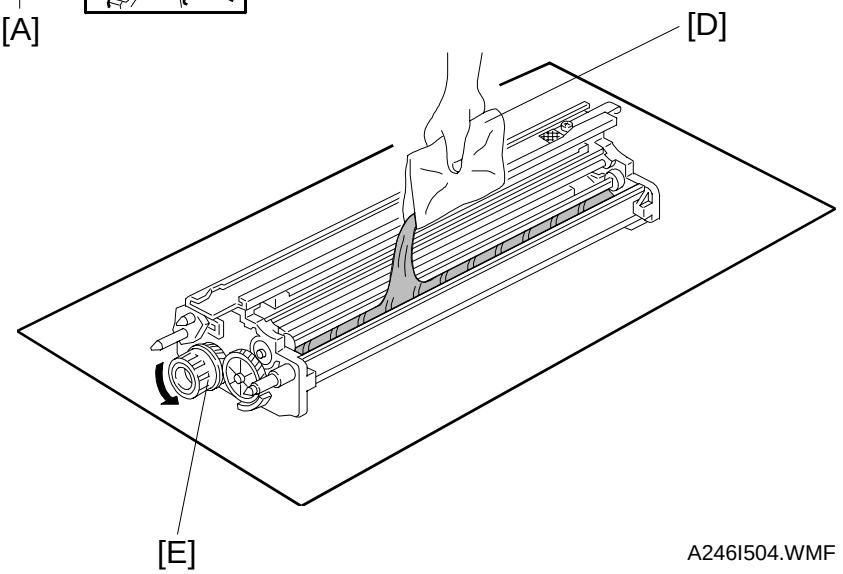


A246I502.WMF

9. Remove the shutter inner cover [A] (1 screw).
10. Release the shutter lever [B] fully to the front.
11. Remove the screw [C] securing the toner bottle holder bracket.
12. Swing out the toner bottle holder [D].
13. Remove the screw [E] securing the drum stay [F].
14. Remove the drum stay knob [G] and the drum stay. (Turn the knob clockwise to remove it.)
15. Disconnect two connectors [H].



A246I503.WMF



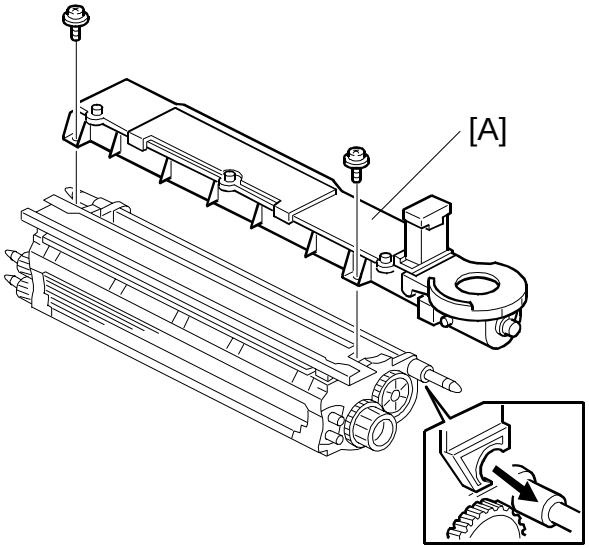
A246I504.WMF

16. Pull out the development unit.
    NOTE: 1) To prevent drum scratches, push the development unit to the right while pulling it out.
    2) Place the development unit on the sheet attached with the new developer to prevent foreign matter from being attracted to the sleeve rollers.
    3) When pulling out the development unit, do not pull on the knob [A].

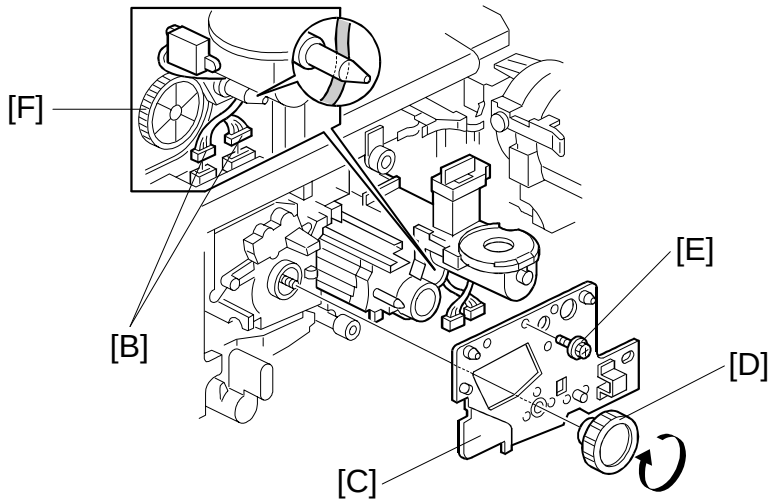
17. Remove two screws [B] securing the toner hopper [C].

18. Remove the toner hopper [C] from the development unit, as shown.

19. Evenly pour in one pack of developer [D] while turning the knob [E]. Distribute the developer evenly along the development unit.
    NOTE: To prevent the developer from spilling, do not rotate the gears in the opposite direction.

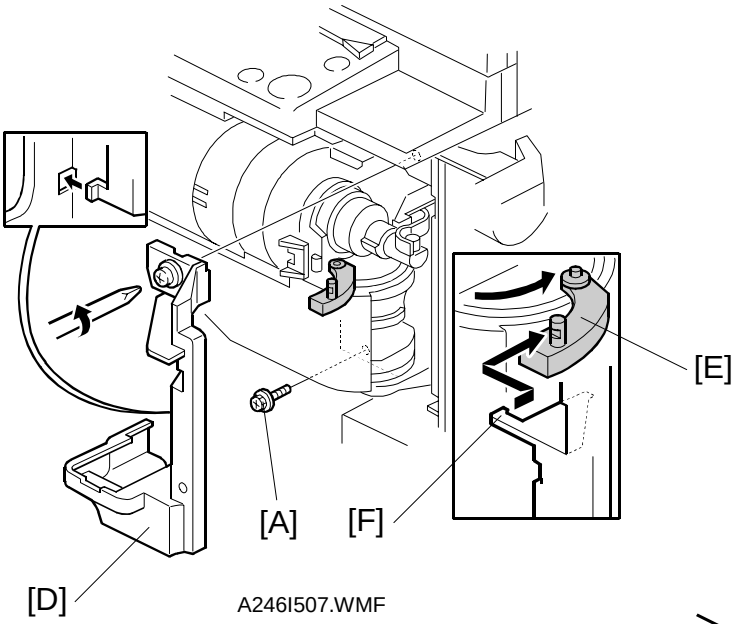


A246I505.WMF

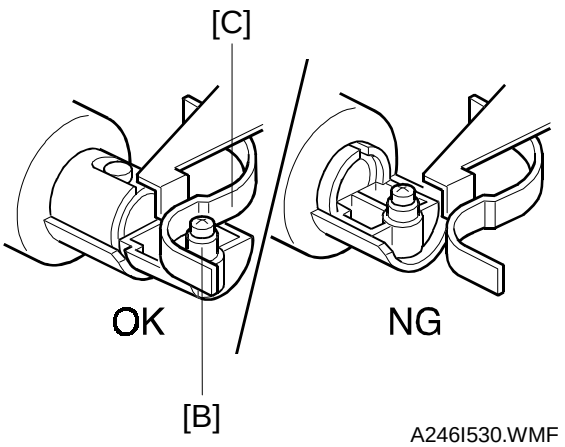


A246I506.WMF

20. Attach the toner hopper [A] to the development unit (2 screws).
21. Install the development unit in the machine.
22. Connect two connectors [B].
23. Install the drum stay [C] and attach the drum stay knob [D] and one screw [E].
    NOTE: When installing the drum stay, be careful not to pinch the harness and keep the harness away from the gear [F].



A246I507.WMF

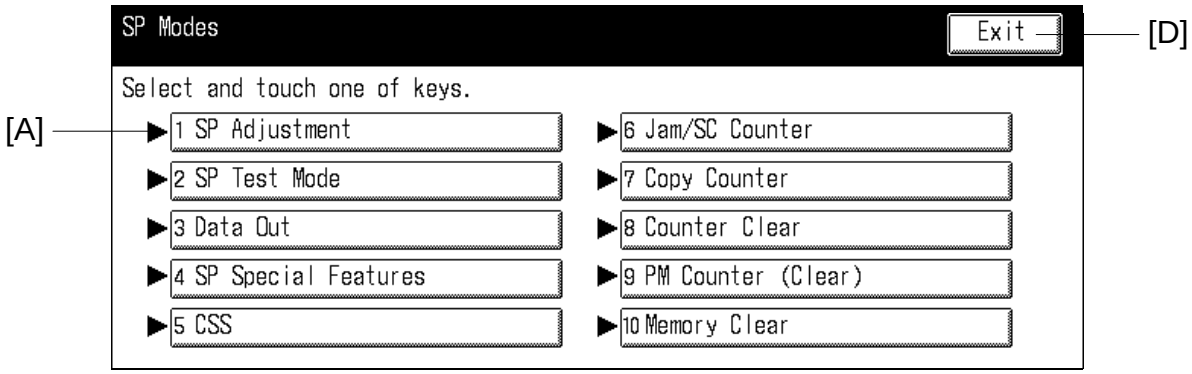


A246I530.WMF

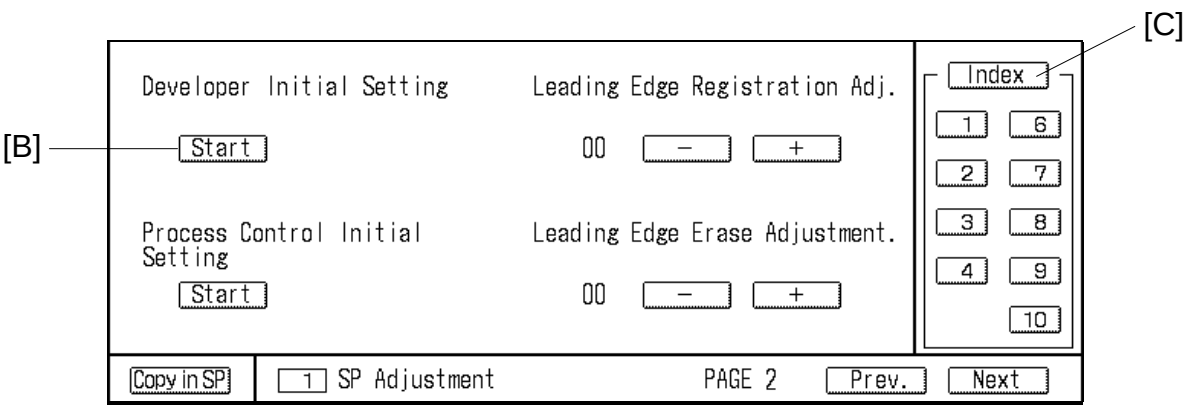
24. Set the toner bottle holder in position (1 screw [A]).
    NOTE: Make sure that the projection [B] of the toner bottle holder is set on the right side of the bracket [C],as shown, otherwise, toner will not be supplied.
25. Install the shutter inner cover [D], as shown (1 screw).
    NOTE: Hang the shutter lever [E] on the hook [F].
26. Install a toner bottle by following the instructions on the decal.
    NOTE: -26, -27 machines only
    Before plugging in the power cord, install the guidance ROMs. (See GUIDANCE ROM INSTALLATION.)
27. Plug in the power code, then turn on the main switch. The machine automatically enter the process control data initial setting mode.
    NOTE: Do not make any copies until the developer initial settings are complete. Do not turn off the main switch during the process control data initial setting mode.

28. Enter SP mode as follows:
    1) Press the “Clear Mode” key.
    2) Enter “107”.
    3) Press the Clear/Stop key for more than 3 seconds.





A246I508.PCX



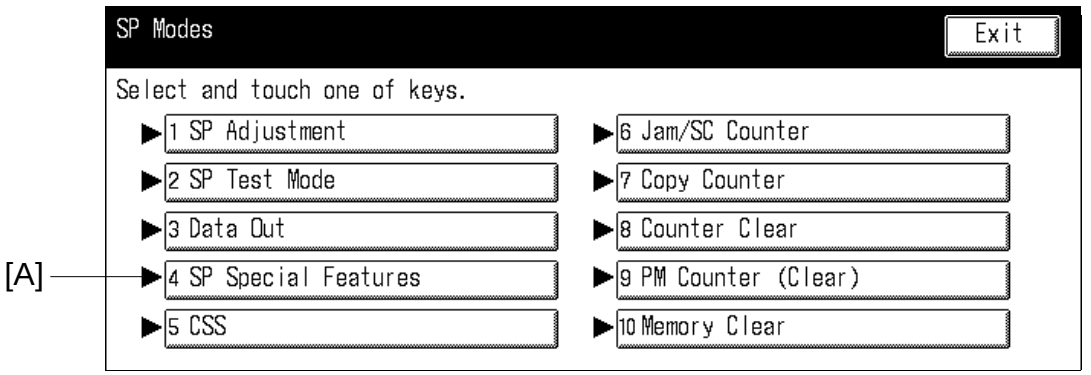
A246I533.PCX

29. Touch the “SP Adjustment” key [A].

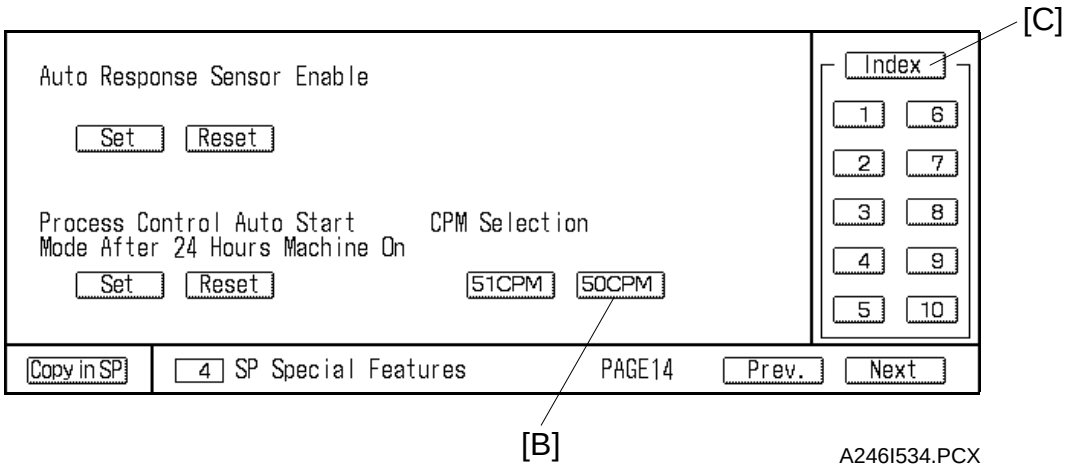
30. Enter SP1-2-1 (Developer Initial Setting), then touch the “Start” key [B].
    NOTE: Developer initial setting stops automatically.

31. Press the “Index” key [C].

NOTE: If the developer initial setting is not completed, you cannot exit the SP mode by pressing the “Exit” key [D]. If this occurs, turn the main switch off and on then repeat steps 26 to 29 again. If the result is the same, see the troubleshooting section “SC352”.



A246I508.PCX

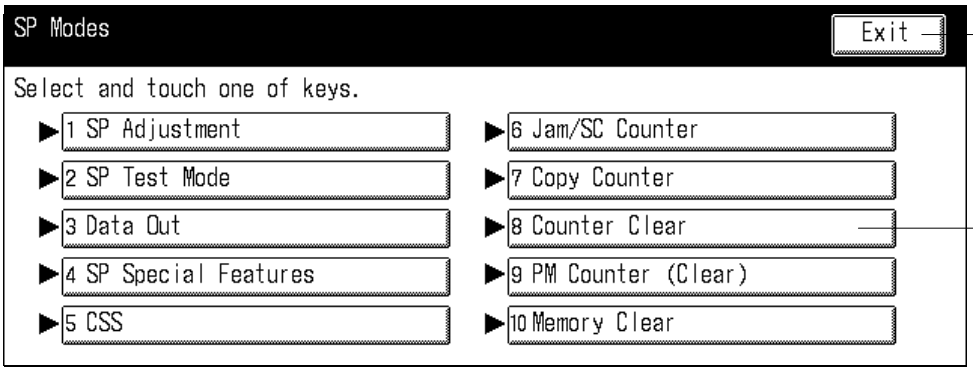


A246I534.PCX

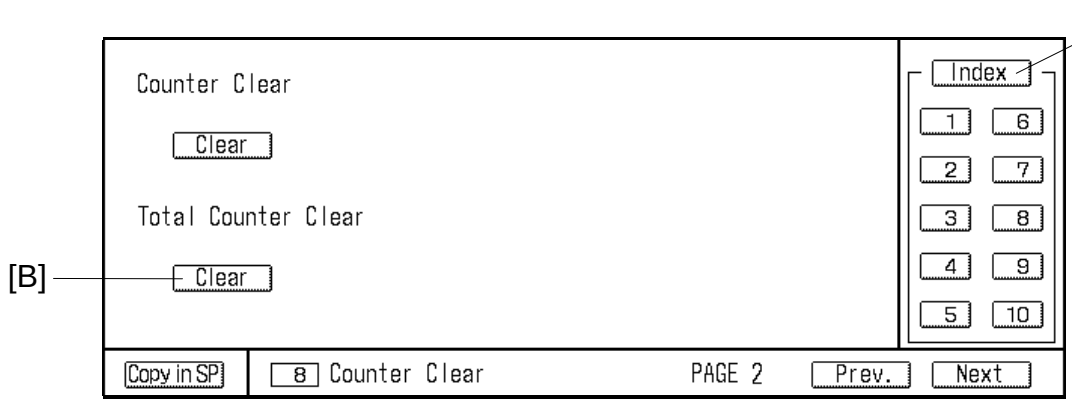
32. **- Only in France -**

This step is for the 50 CPM version machine only.

1) Touch “SP Special Features” key [A].
2) Enter SP4-14-4 (CPM Selection), then touch the “50 CPM” key [B].
3) Press the “Index” key [C].



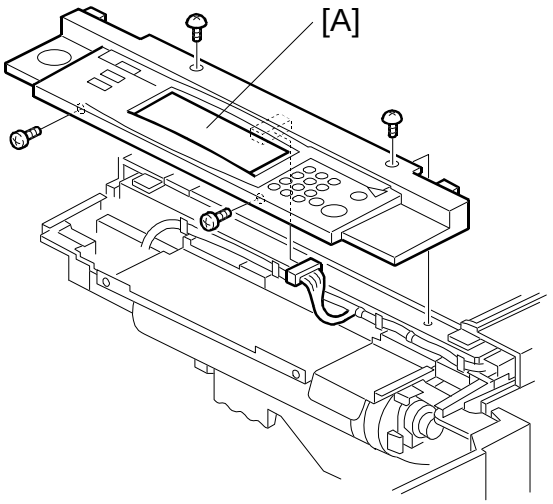
A246I508.PCX



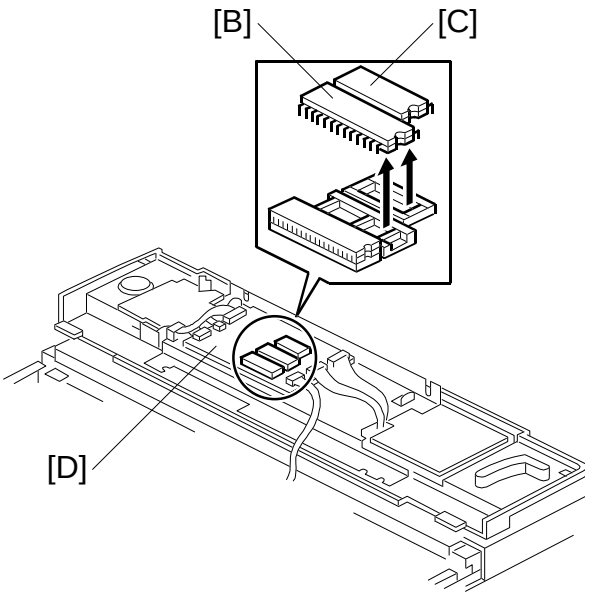
A246I536.PCX

33. Touch “Counter Clear” key [A].
34. Enter SP8-2-2 (Total Counter Clear), then touch the “Clear” key [B].
35. Touch the “Index” key [C].
36. Touch the “Exit” key [D] to exit SP mode.
37. Check copy quality and machine operation.

3.2.3 GUIDANCE ROM INSTALLATION (OPTION: EUROPE VERSION ONLY)



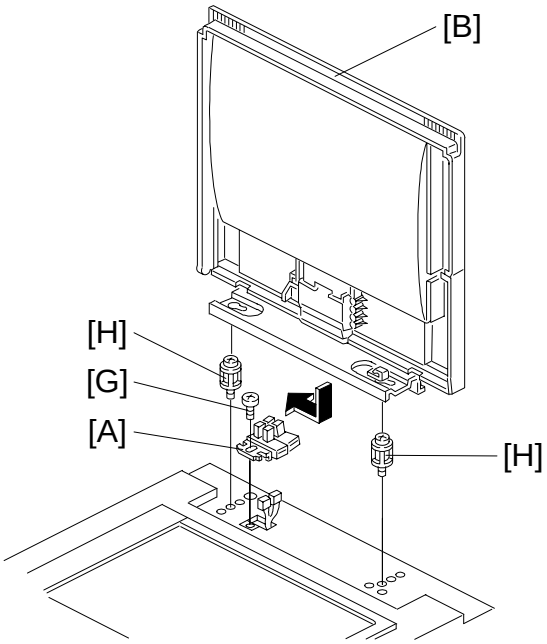
A246I516.WMF



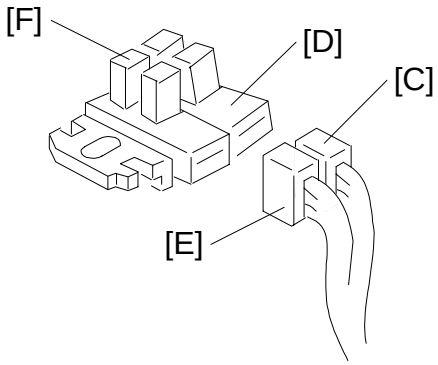
A246I538.WMF

1. If necessary, replace the two guidance ROM chips on the operation panel PCB with the optional guidance ROM chips as follows:
   1) Remove the operation panel [A] (4 screws, 1 connector).
   2) Replace the guidance ROMs (IC106 [B], IC108 [C]) on the operation panel PCB [D].
   3) Re-install the operation panel.
      NOTE: Be careful not to touch the grounding wire terminal with the circuit pattern on the operation panel when re-installing the operation panel.

3.2.4 PLATEN COVER (OPTION) INSTALLATION



A246I525.WMF

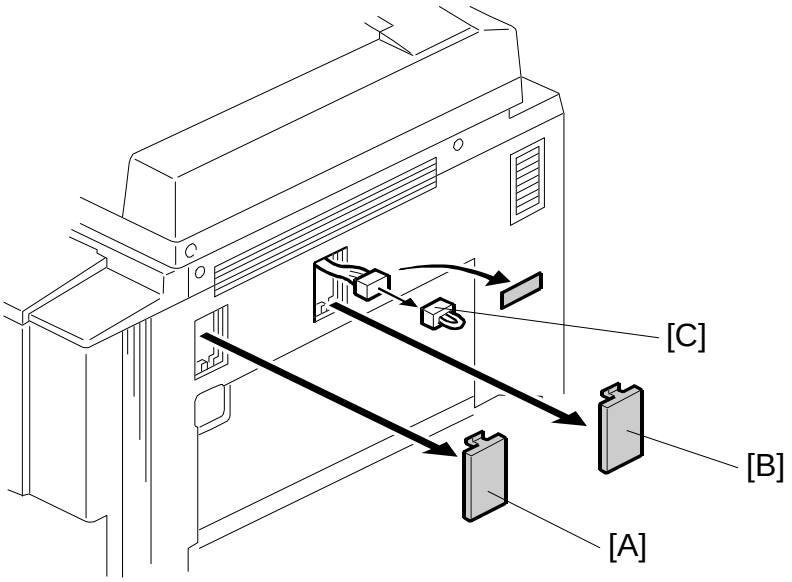


A246I526.WMF

Install the optional platen cover as follows:

1. Install the sensor ass'y [A] which is an accessory of the platen cover [B], as follows:
   1) Connect the red connector [C] to the rear sensor [D].
   2) Connect the white connector [E] to the front sensor [F].
   3) Secure the sensor assembly with a screw [G].
2. Install the platen cover hooks [H].
3. Install the platen cover [B].

3.2.5 KEY COUNTER HOLDER INSTALLATION (OPTION)



A246I527.WMF

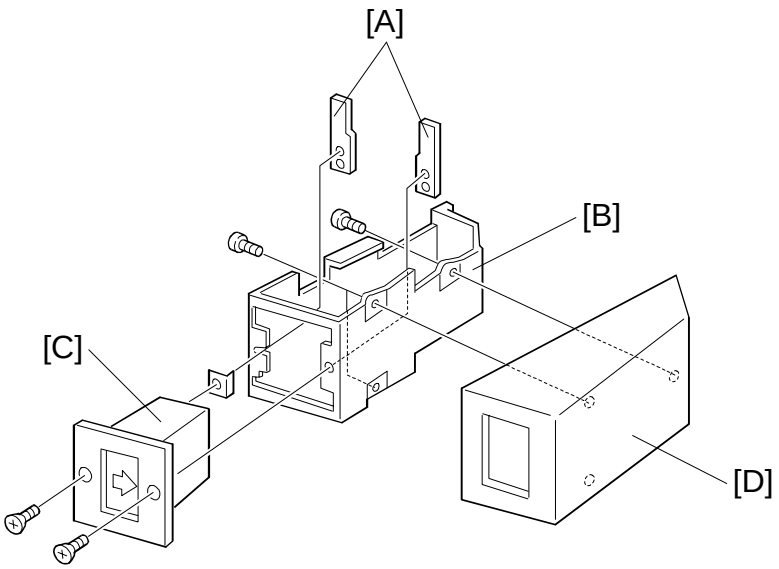
⚠CAUTION

Unplug the copier power cord before starting the following procedure.

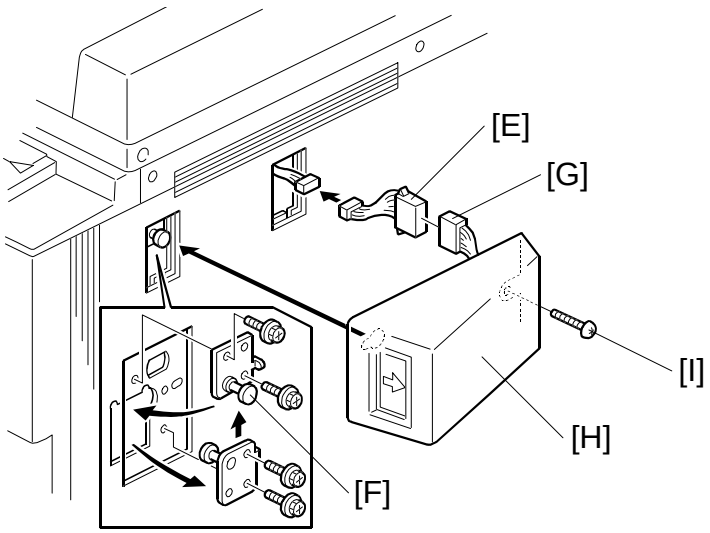
NOTE: The Key Counter Bracket Set includes the following parts. The key counter holder and key counter should be procured locally.

1. Key Counter Bracket 1
2. Key Counter Plate Nut..... 2
3. Key Counter Cover 1
4. Accessory Harness..... 1
5. Screws..... 4
6. Stepped Screw (not used for this model)..... 1

1. Remove the two plastic caps [A] and [B] on the right upper cover of the copier.
2. Remove the short-circuit connector [C].



A246I528.WMF

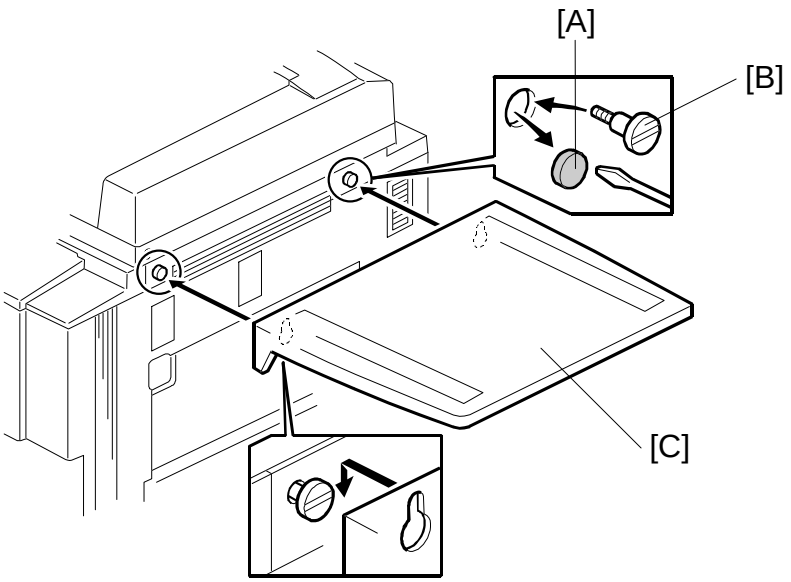


A246I529.WMF

3. Hold the key counter plate nuts [A] on the inside of the key counter bracket [B] and insert the key counter holder [C].
4. Fix the key counter holder [C] to the bracket [B] (2 screws).
5. Install the key counter cover [D] (2 screws).
6. Install the connector of the accessory harness [E].
7. Replace the key counter hold pin [F] as shown.
8. Connect the connector [G] of the key counter holder.
9. Hook the key counter holder assembly [H] to the key counter hold pin [F].
10. Secure the key counter holder assembly [H] with a screw [I].

3.2.6 ORIGINAL TRAY INSTALLATION (OPTION)

NOTE: The original tray includes the following parts.



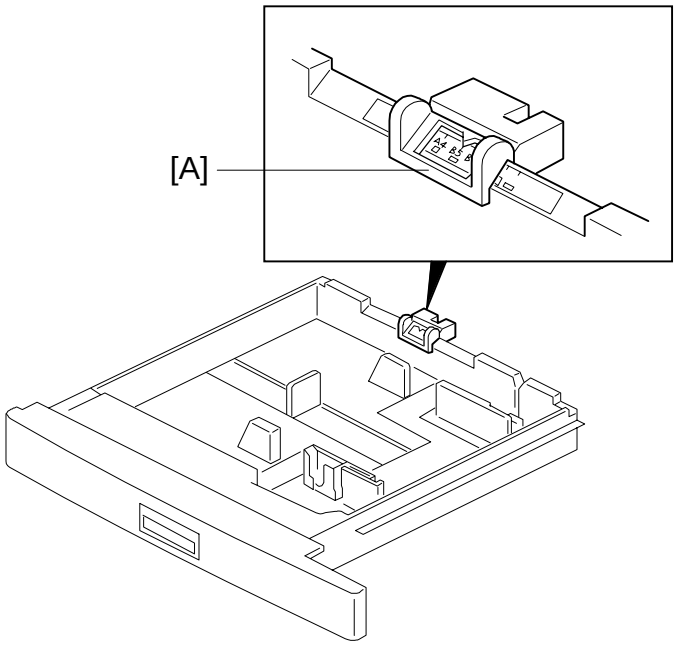
A246I515.WMF

1. Original tray 1
2. Stepped screw 2

1. Remove the two plastic caps [A].
2. Install the stepped screws [B].
3. Set the original tray [C], as shown.

3.3 UNIVERSAL TRAY (TRAY 2)

NOTE: At the factory, this tray is set up for A4 or LT lengthwise depending on the machine destination code.

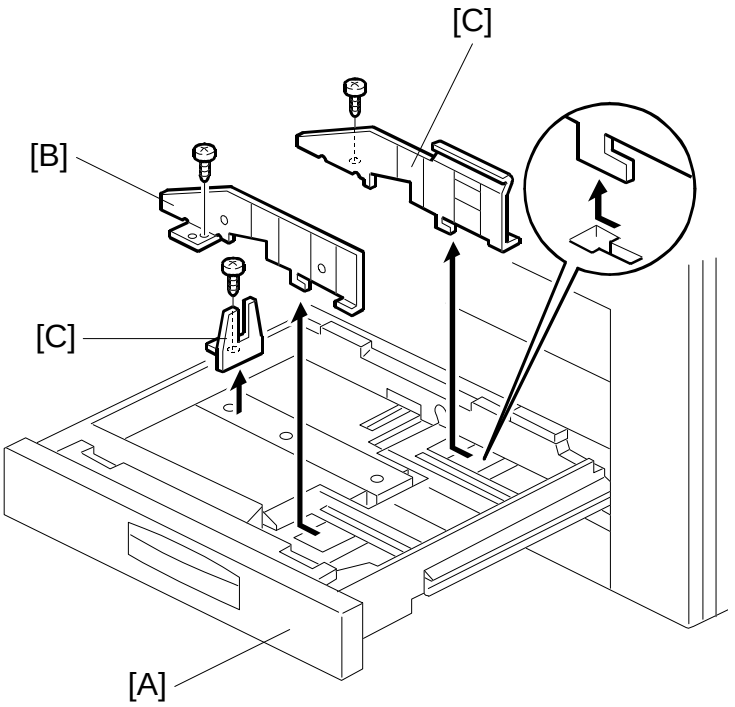


A246I517.WMF

Slide the paper size slider [A] to the paper size indication that matches the paper size in the tray. The following paper sizes can be selected with the paper size slider.

A4/A3 Version	LT/DL Version
A3 (lengthwise)	11" x 17"
A4 (lengthwise)	8 1/2" x 14"
A4 (sideways)	8 1/2" x 11"
A5 (sideways)	11" x 8 1/2"
8 1/4" x 13" (lengthwise)	8 1/2" x 5 1/2"
8 1/2" x 13" (lengthwise)	8" x 10 1/2"
–	11" x 15"
–	10" x 14"
–	8" x 10"
–	8" x 13"

3.4 550 SHEETS PAPER TRAY (TRAY 3)



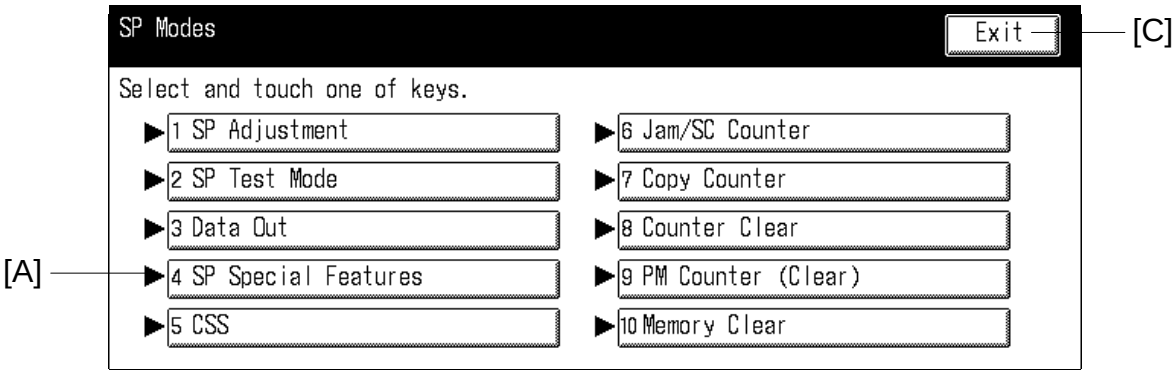
A246I519.WMF

At the factory, the 3rd paper cassette is set as A3 or DLT. Change the paper size as follows.

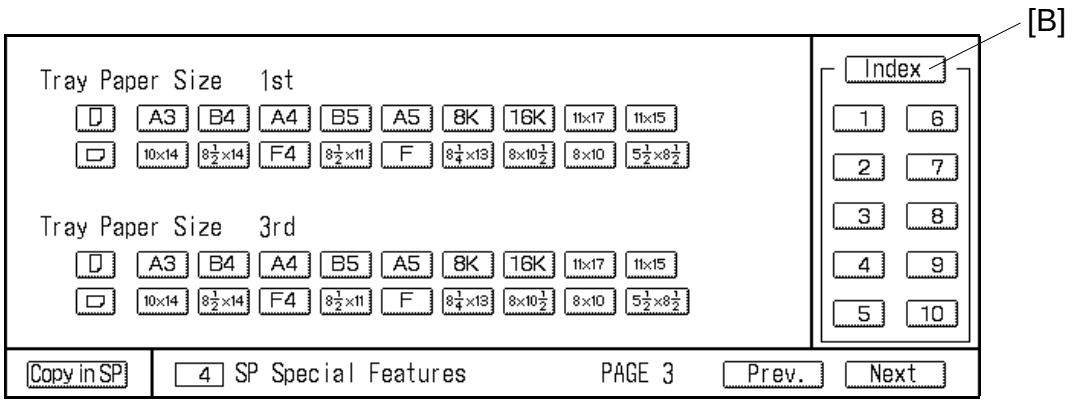
1. Draw out the paper feed tray [A].
2. Change the position of the front and the rear side fences [B] (2 screws each) and end fence [C] (one screw) according to the paper size.

3. Enter SP mode as follows:
   1) Press the “Clear Mode” key.
   2) Enter “107”.
   3) Press the clear/stop key more than 3 seconds.





A246I508.PCX


[B]
Tray Paper Size 1st
Tray Paper Size 3rd
A3 B4 A4 B5 A5 8K 16K 11×17 11×15
10×14 8½×14 F4 8½×11 F 8¼×13 8×10½ 8×10 5½×8½
Index
1 2 3 4 5 6 7 8 9 10
Copy in SP
4 SP Special Features
PAGE 3
Prev.
Next

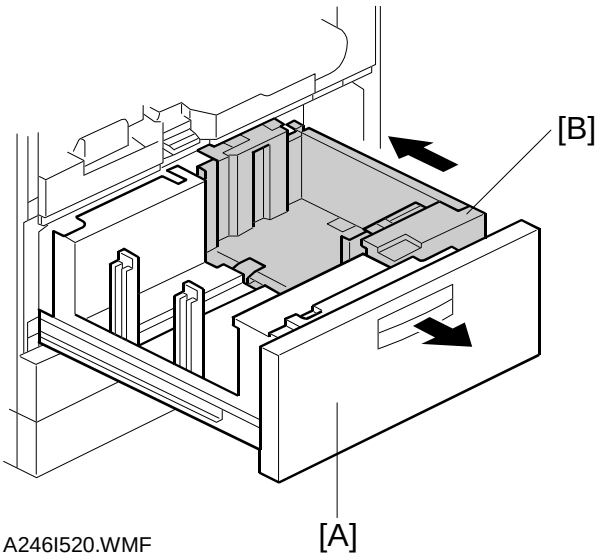
A246I535.PCX

4. Touch the “SP Special Feature” key [A].
5. Enter SP4-3-2 (Tray Paper Size 3rd), then touch the appropriate paper size of the 3rd tray.
6. Touch the “Index” key [B].
7. Touch the “Exit” key [C] to exit SP mode.
8. Check copy quality and machine operation.

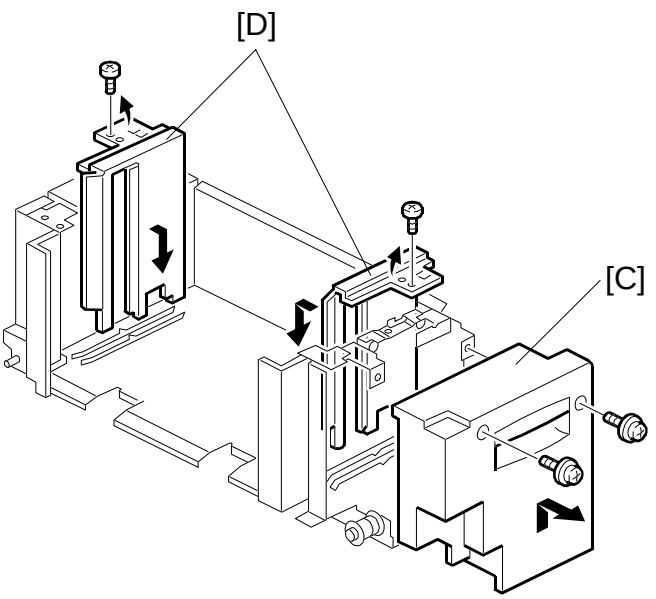
NOTE: If A4/LT sideways or shorter size is selected, change the setting of the side-to-side registration (SP1-1-1) so that its value is the same as that of the duplex tray.
Then, reposition the tray (refer to the side-to-side registration adjustment). Otherwise, lens will shift position slightly between duplex feed and tray feeding. This may affect the duplex productivity a little bit.

3.5 TANDEM FEED TRAY PAPER SIZE CHANGE (TRAY 1)

NOTE: At the factory, this tray is set up for A4 or LT sideways. Only A4 or LT sideways paper can be used for tandem feed.

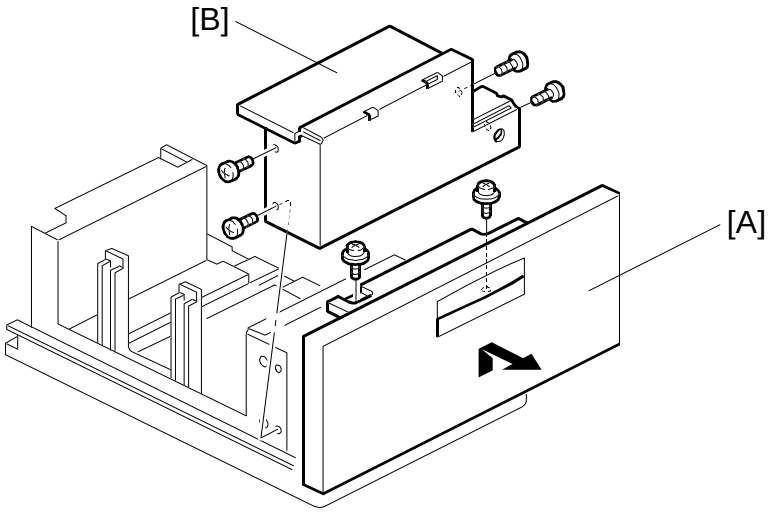


A246I520.WMF

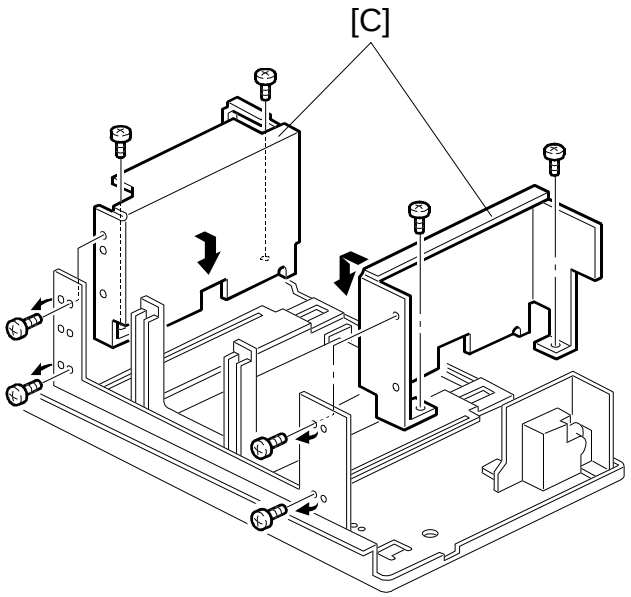


A246I521.WMF

1. Open the front cover.
2. Completely pull out the tandem feed tray [A] to separate right tandem tray [B] from the left tandem tray.
3. Remove the right tandem inner cover [C].
4. Re-position the side fences [D] (1 screw each). The outer slot position is used when loading A4 size paper.
5. Reinstall the right tandem inner cover [C].

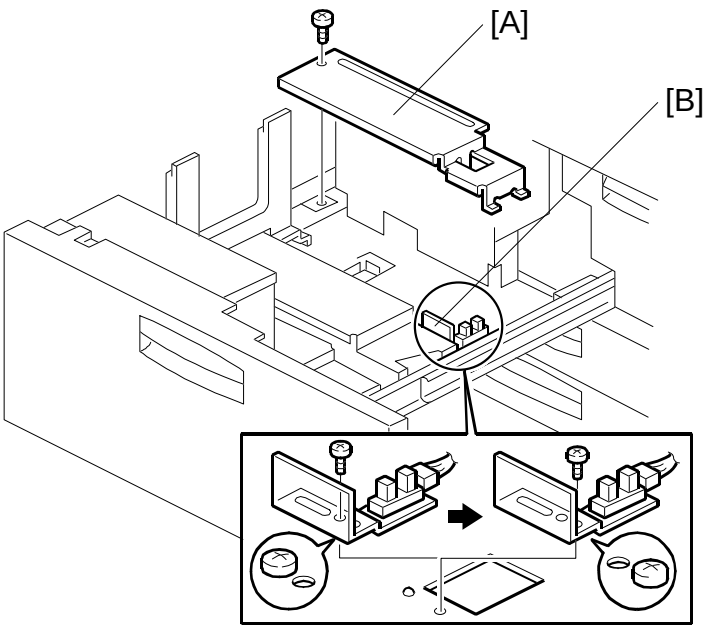


A246I522.WMF



A246I523.WMF

6. Remove the tray cover [A] (2 screws).
7. Remove the DC motor bracket [B] (4 screws).
8. Re-position the side fences [C] (4 screws each). The outer slot position is used when loading A4 size paper.
9. Reinstall the DC motor bracket [B] and the tray cover [A].



A246I524.WMF

10. Remove the rear bottom plate [A] (1 screw).
11. Re-position the return position sensor bracket [B] (1 screw). To use the paper tray for A4 size, set the screw on the left hole as shown. (For LT size, the screw should be placed on the right.)
12. Reinstall the rear bottom plate.
13. Perform steps 3 to 7 from the “550 Sheet Paper Tray Size Change” procedure.

3.6 DUAL JOB FEEDER (A610)

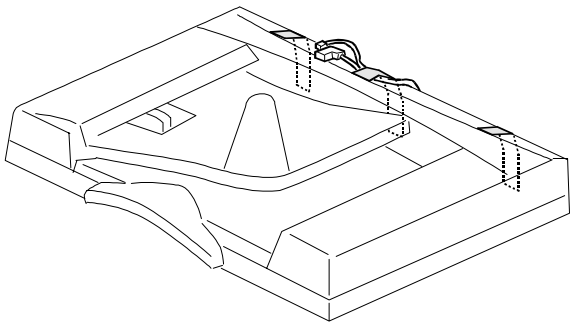
3.6.1 ACCESSORY CHECK

Check the accessories against the following list:

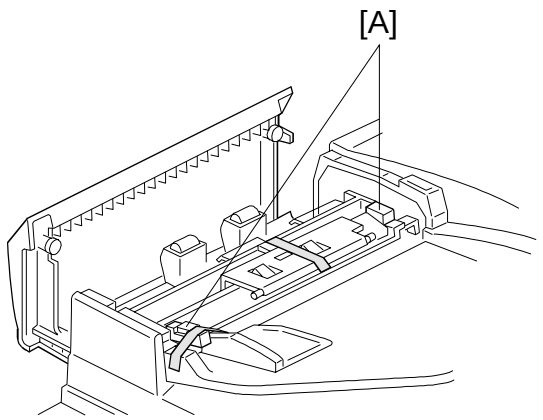
Description	Q'ty
1. Stepped Screw	2
2. Sponge Retainer (*)	1
3. Philips Pan Head Screw with Washer - M5 x 10	2
4. Hinge Stopper Bracket	2
5. Philips Pan Head Screw - M4 x 6	2
6. Feed-out Guide Mylar	1
7. Decal	1

(*) The sponge retainer is not necessary to install the DJF onto this copier.

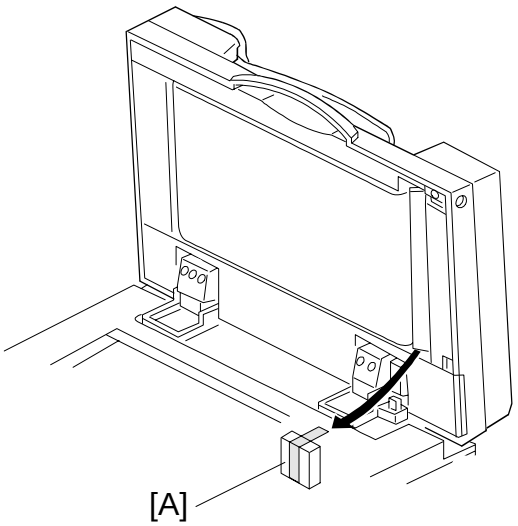
3.6.2 INSTALLATION PROCEDURE



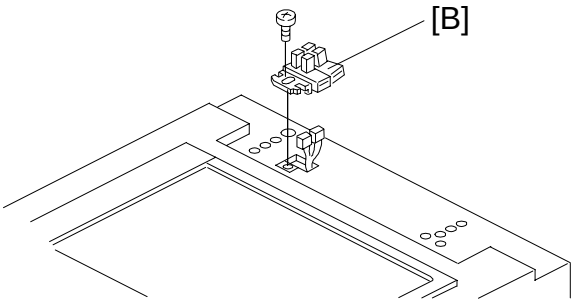
A610I500.WMF



A610I501.WMF



A610I502.WMF

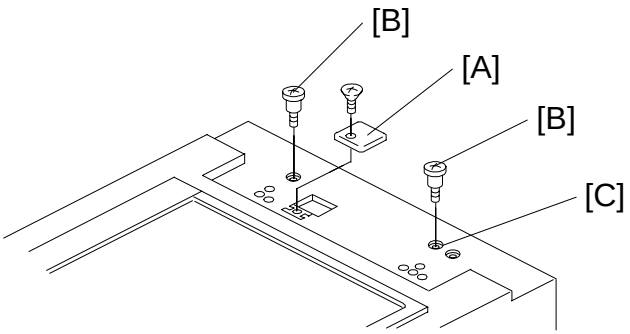


A610I510.WMF

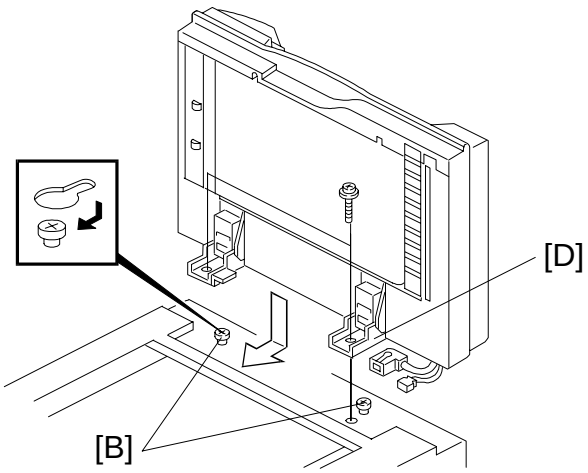
⚠CAUTION

Unplug the copier power cord before starting the following procedure.

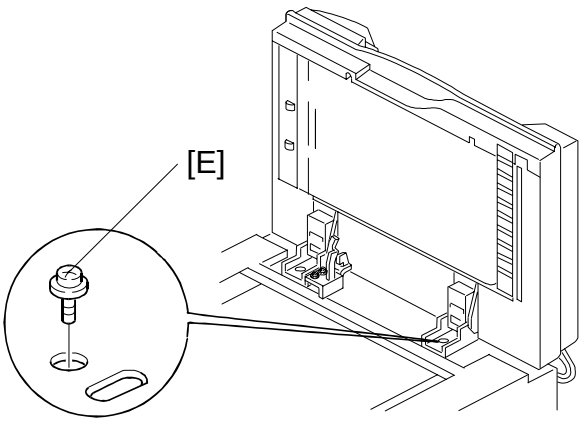
1. Remove the tape strips and the cushions [A] as shown.
2. Remove the sensor [B], if installed (1 screw).
   NOTE: Sensor [B] is not installed with the copier. It is an accessory of the platen cover (option).



A610I511.WMF

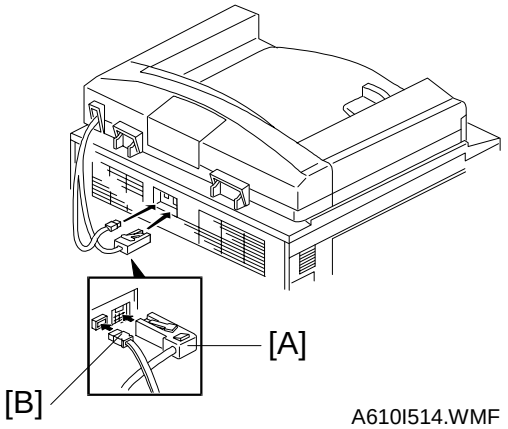


A610I512.WMF

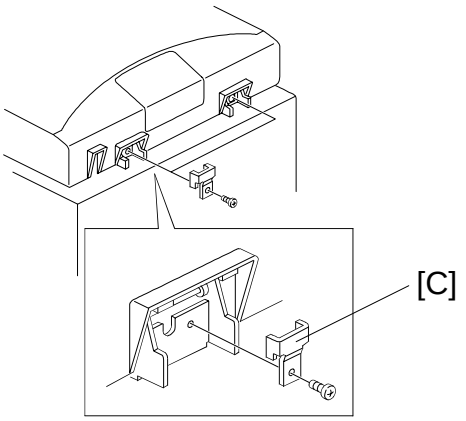


A610I513.WMF

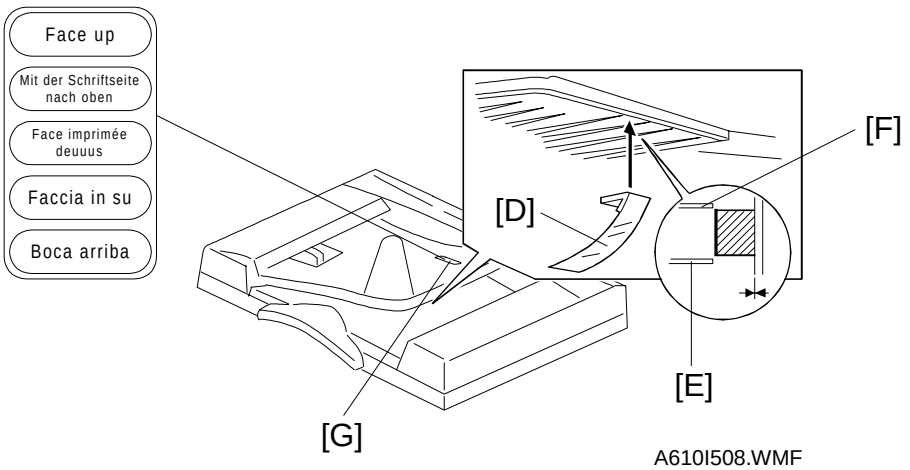
3. Install the cover [A] with the screw (if necessary). The cover and screw are supplied as an accessory with the copier.
4. Install the two stepped screws [B].
   NOTE: There is one screw hole on the left side for the stepped screw. However, there are two screw holes on the right where the stepped screw is to be installed. Install the stepped screw into the inner screw hole [C], as shown in the illustration.
5. Mount the DF to the copier [B] by inserting the screws into the holes of the DF hinge [D], then slide the DF to the front as shown.
6. Secure the DF to the copier by using the screw hole as shown (2 screws - M5 x 10 [E]).



A610I514.WMF



A610I507.WMF



A610I508.WMF

7. Remove the small cap on the upper rear cover, then connect the main connector [A] and the fiber optic cable connector [B].

CAUTION: When connecting the fiber optic cable, make sure to mount it over the main connector to prevent it from being bent.

8. Secure the hinge stopper bracket [C], as shown (2 screws - M4 x 6).
9. Attach the feed-out guide mylar [D] under the original table. Attach it between the 3rd [E] and 4th [F] ribs (counting from the rear).
10. Apply appropriate decal at [G].
11. Plug in the copier and turn on the main switch.
    NOTE: The copier automatically recognizes that the DF has been installed.
12. Make copies using the DF and confirm the machine functions properly.
13. Explain to the customer that some settings may now be changed, according to the characteristics of each original.

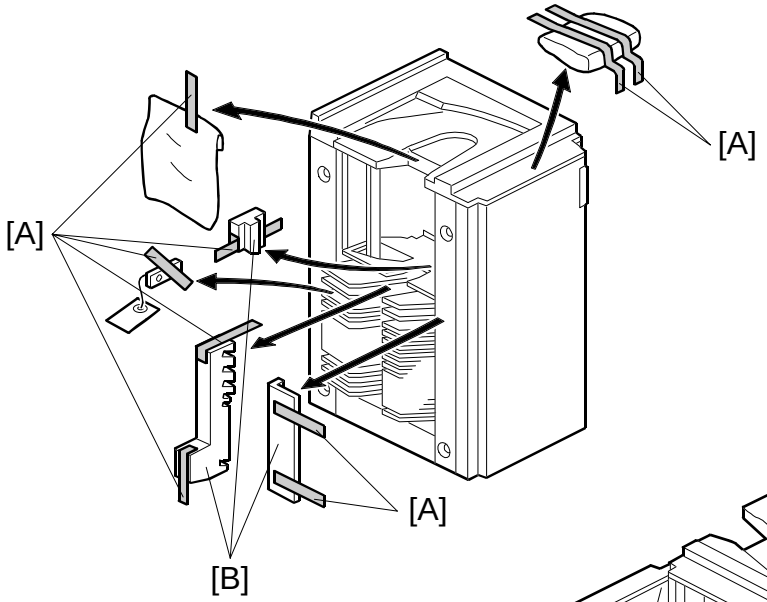
3.7 SORTER STAPLER (A821)

3.7.1 ACCESSORY CHECK

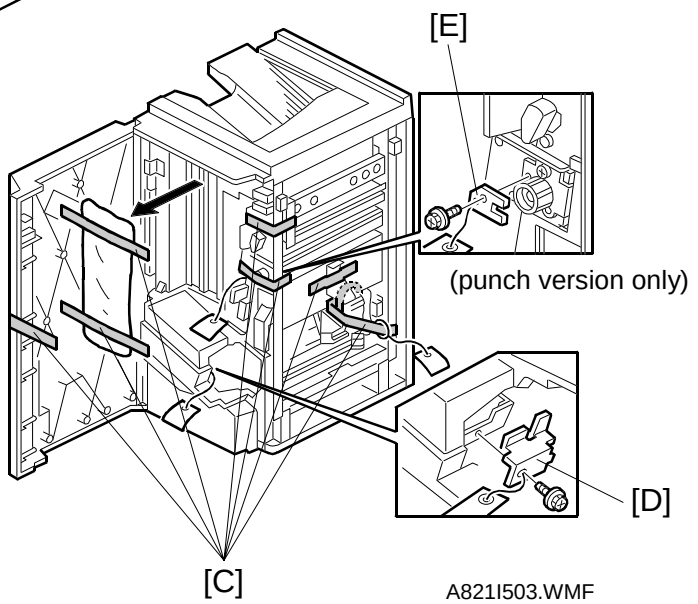
Check the contents of the box according to the following list.

Description	Q'ty
1. Front Connection Bracket	1
2. Rear Connecting Bracket	1
3. Cushion	1
4. Entrance Guide Mylar	1
5. Caster Stopper	2
6. Relay Guide	1
7. Philips Pan Head Screw - M4 x 12	4
8. Tapping Screw - M4 x 6	3
9. Philips Pan Head Screw - M4 x 5	2
10. Punch Position Decal (Punch version only)	1
11. Lower Grounding Plate	1

3.7.2 INSTALLATION PROCEDURE



A821I502.WMF



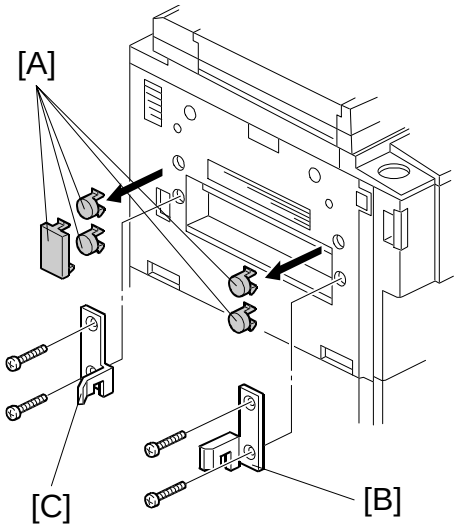
A821I503.WMF

⚠CAUTION

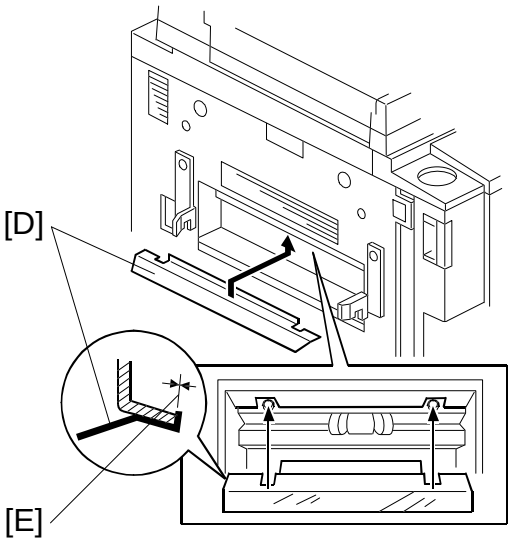
Unplug the copier power cord before starting the following procedure.

NOTE: 1) Keep the shipping retainers after installing the machine. They will be reused if the machine will be transported to another location.
2) Proper reinstallation of the shipping retainers is required in order to avoid any transport damage.

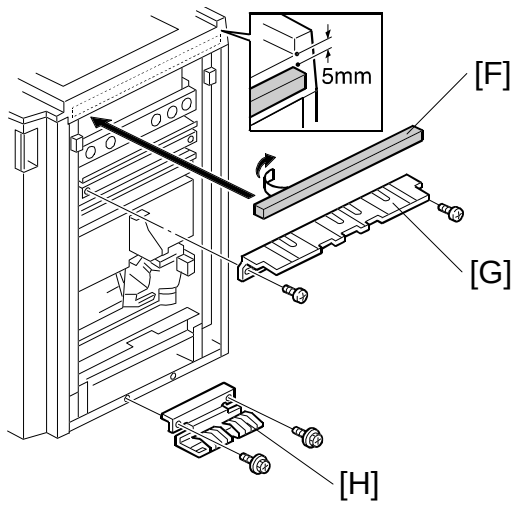
1. Remove the strips of tapes [A] and the cushions [B].
2. Open the front door.
3. Remove the strips of tapes [C].
4. Remove the shipping retainers [D, E] (1 screw each).



A821I504.WMF

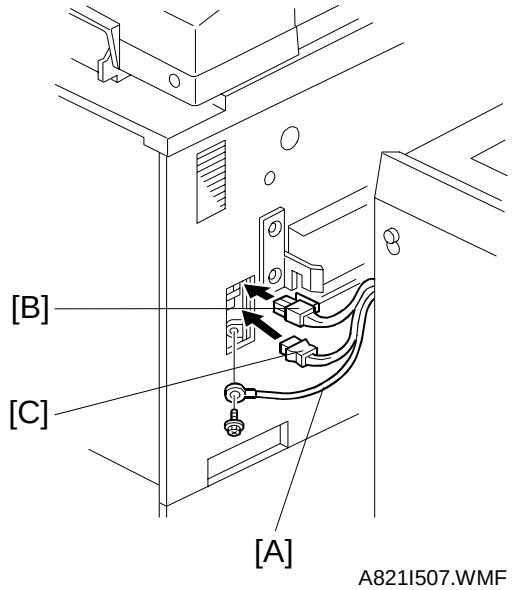


A821I505.WMF

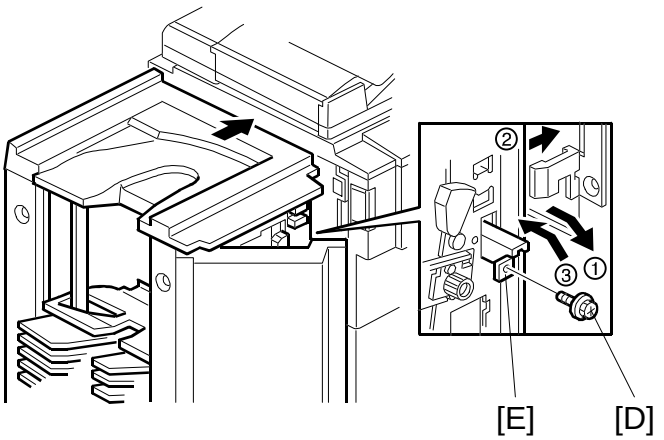


A821I506.WMF

5. Remove the five plastic caps [A] on the copier left cover.
6. Install the front connecting bracket [B] (2 screws - M4 x 12) and the rear connecting bracket [C] (2 screws - M4 x 12) on the copier.
7. Attach the entrance guide mylar [D] to the copier exit area, as shown.
   NOTE: Align the edge [E] of the cover and the mylar.
8. Attach the cushion [F], as shown.
9. Install the relay guide [G], as shown (2 screws M4 x 5).
10. Install the lower grounding plate [H] (2 tapping screws M4 x 6).

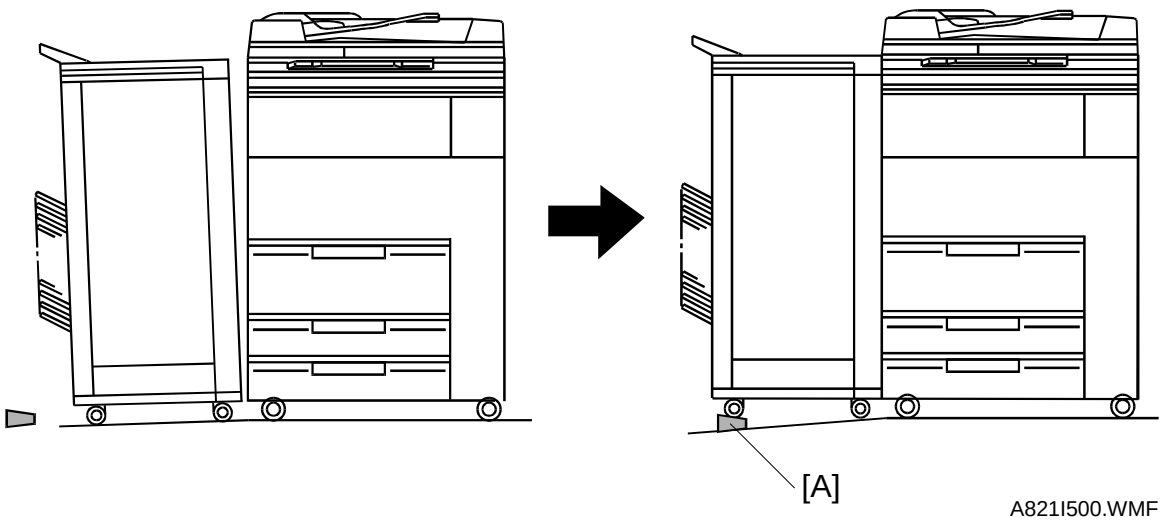


A821I507.WMF

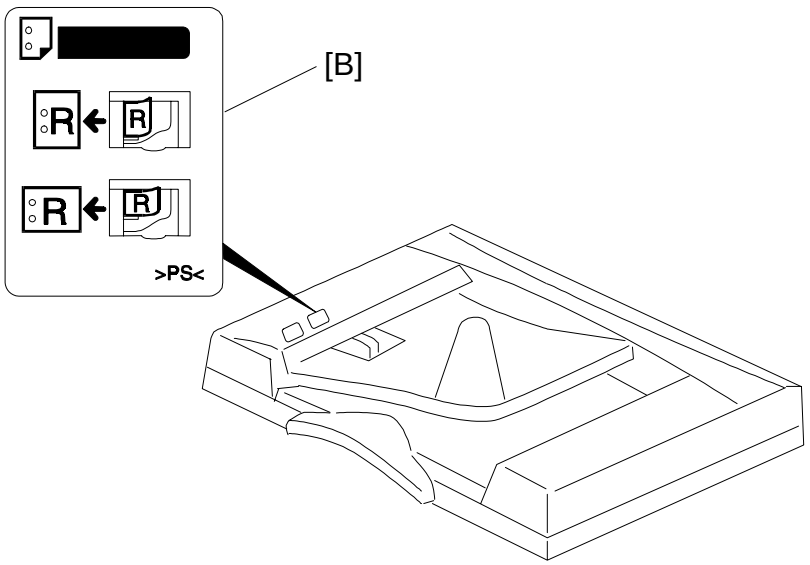


A821I508.WMF

11. Secure the protective earth wire [A] (1 tapping screw M4 x 6).
12. Connect the 4P connector [B] and the fiber optic connector [C].
13. Open the front door of the sorter stapler and remove the screw [D] securing the locking lever [E], then lower the locking lever.
14. Align and press the sorter stapler against the copier and secure it by raising the locking lever [E].
15. Tighten the screw [D].



A821I500.WMF



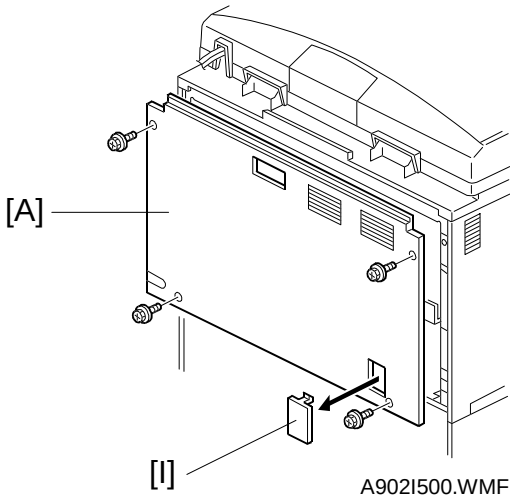
A821I501.WMF

16. If the gap between the top of the sorter stapler and the copier is too great, narrow the gap by placing caster stoppers [A] under the weels, as shown.
17. Stick the punch position decal [B] on the DF entrance cover (punch version only).
18. Plug in the copier.
19. Turn on the main switch of the copier and test the operation of the sorter stapler.
    NOTE: The copier automatically recognizes that the sorter stapler has been installed.

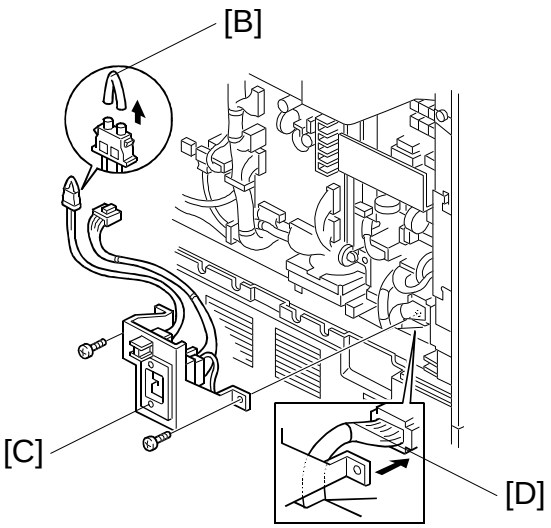
3.7.3 SORTER ADAPTER INSTALLATION (OPTION)

1. Interface Harness Bracket 1
2. Exit Paper Guide 1
3. Clump 1
4. Tapping Screw - M4 x 8 2
5. Screw - M4 x 20 5

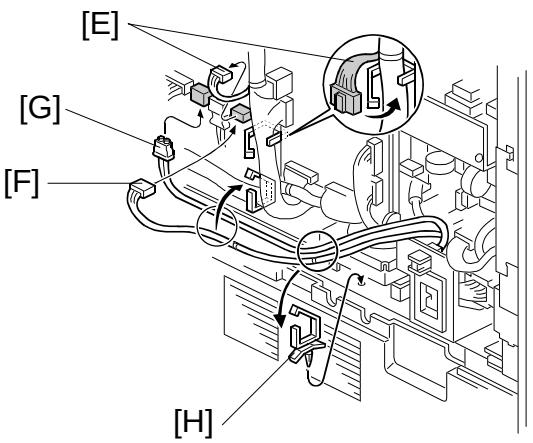
NOTE: When the sorter stapler (A658) is installed on A246 copier, the sorter adapter (A902-19) is required.



A902I500.WMF



A902I501.WMF



A902I502.WMF

NOTE: 5 flat head screws and the exit paper guide are included as accessories of the sorter adapter. They should be used for the installation of the sorter stapler (A658). For details see the sorter stapler installation procedure.

1. Remove the rear cover [A] (4 screws).
2. Remove the cap of the optics fiber cable [B].
3. Install the interface harness bracket [C] with two tapping screws, M4 x 8.
   NOTE: Ensure the black harness [D] is not caught by the bracket.
4. Disconnect the 4P connector [E] (CN127) on the control board and clamp it as shown.
5. Connect the 4P connector [F] of the interface harness bracket to CN127 and the optics fiber cable [G] to CN129 on the main control board.
6. Install the clamp [H] and mount the harnesses to the clamps, as shown.
7. Remove the plastic cap [I] with a small screw driver and reinstall the rear cover (4 screws).

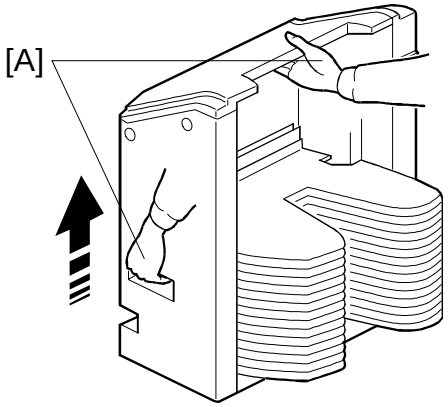
3.8 20 BIN SORTER STAPLER (A658) (A246 ONLY)

3.8.1 ACCESSORY CHECK

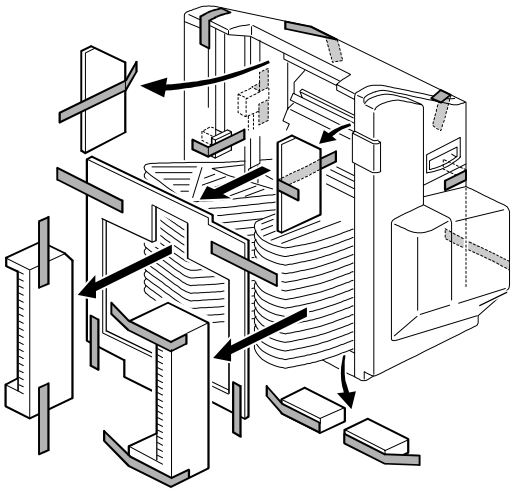
Check the accessory against the following list:

Description	Q'ty
1. Staple Position Decal	1
2. Chain	1
3. Cap Remover	1
4. Philips Pan Head Screw - M4 x 14	5
5. Stepped Screw	1

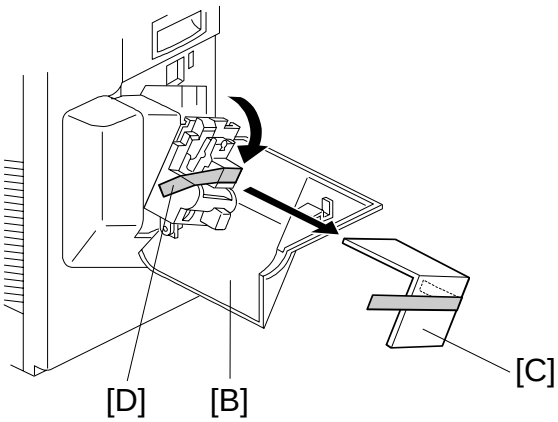
3.8.2 INSTALLATION PROCEDURE



A658I500.WMF



A658I501.WMF



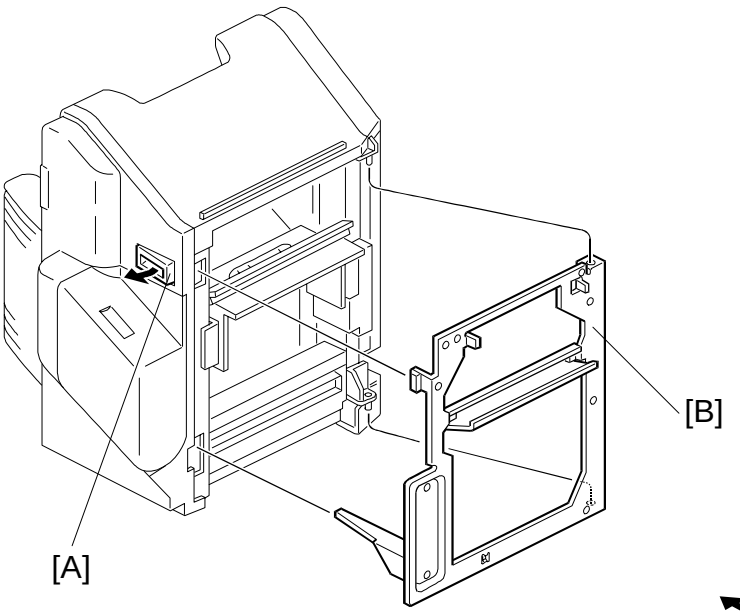
A658I508.WMF

⚠CAUTION

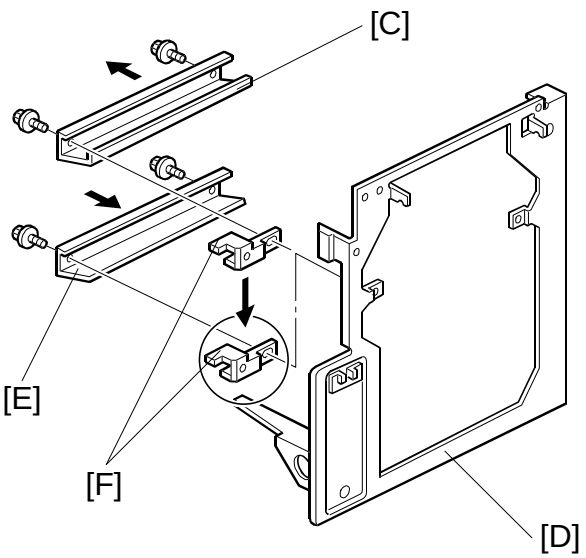
Unplug the copier power cord before starting the following procedure.
When handling the sorter stapler, make sure to hold the parts shown [A].
Otherwise, the resulting damage may cause paper jams at the entrance.

NOTE: 1) Keep the shipping retainers after installing the machine. They will be reused if the machine will be transported to another location.
2) Proper reinstallation of the shipping retainers is required in order to avoid any transport damage.
3) A sorter adapter (A902-19) is required to install this sorter stapler to the copier. Before installing this sorter stapler, install the sorter adapter.

1. Remove the strips of tape and the shipping retainers, as shown.
2. Open the front door [B] and remove the pieces of cardboard [C] and the strip of tape [D] from the staple unit. Close the front door.

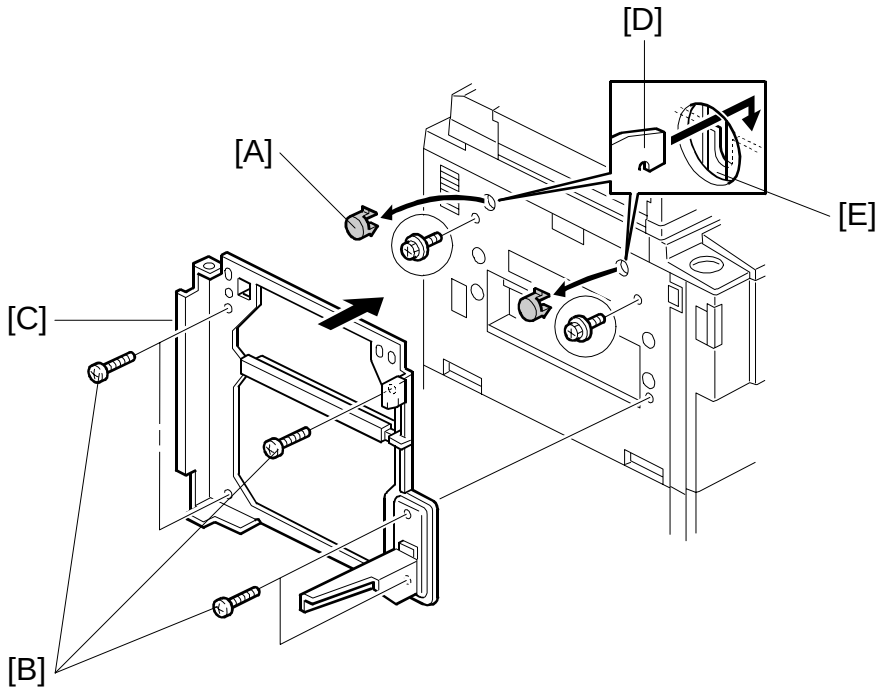


A658I503.WMF



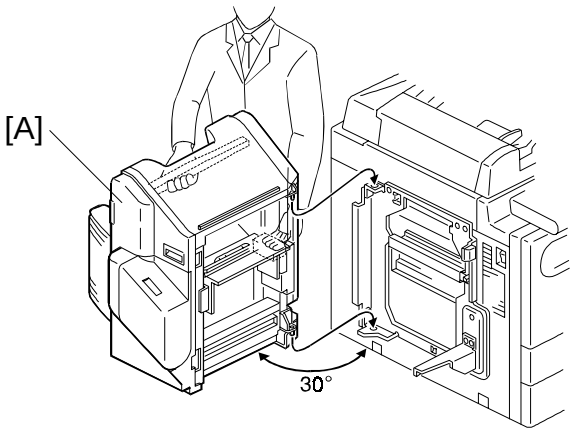
A658I509.WMF

3. Release the open lever [A] of the sorter stapler and remove the sorter stapler mounting frame [B], as shown.
4. Remove the exit paper guide [C] from the mounting frame [D], and install the exit paper guide [E] which is an accessory of the sorter adapter (A902-19) (2 screws).
   NOTE: Reinstall height adjusting bracket [F] to the original position.

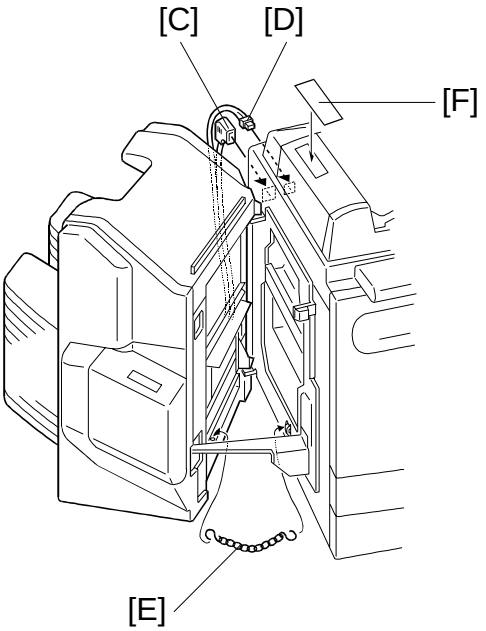


A658I510.WMF

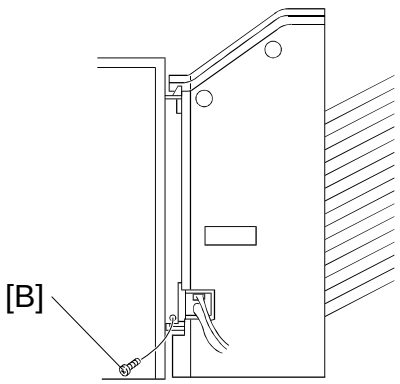
5. Remove the two plastic caps [A] from the copier left cover with a small screw driver.
6. Remove the 4 4M x 8 round head screws [B] form the left cover of the copier.
7. Mount the sorter stapler mounting frame [C] on the copier, as shown (5 screws M4 x 20 which are accessories of the sorter adapter (A902-19)).
   NOTE: When hooking the sorter stapler mounting frame on the left side of the copier, make sure that the positioning hooks [D] of the frame are properly inserted in the positioning holes [E].



A658I505.WMF



A658I507.WMF



A658I506.WMF

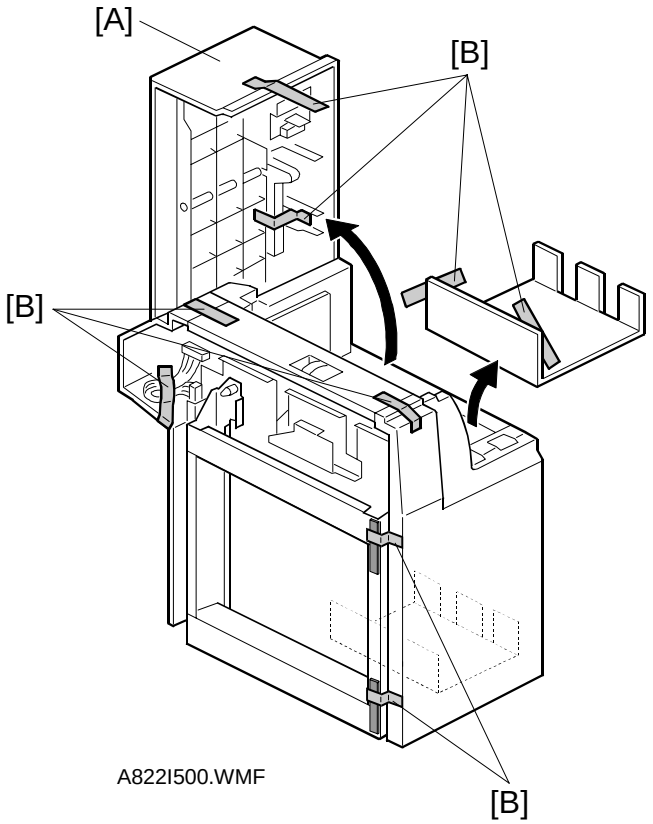
8. Install the sorter stapler [A] on the frame (2 hinge pins at the rear), as shown.
9. Tighten the M4 x 14 screw [B].
   NOTE: This screw prevents the sorter stapler from falling down.
10. Connect the cable [C] and the optic cable [D].
11. Install the chain [E] as shown.
12. Attach the staple position decal [F] as shown.
13. Plug in the copier.
14. Turn on the main switch of the copier and test the operation of the sorter stapler.
    NOTE: The copier automatically recognizes that the sorter stapler has been installed.

3.9 LCT (A822)

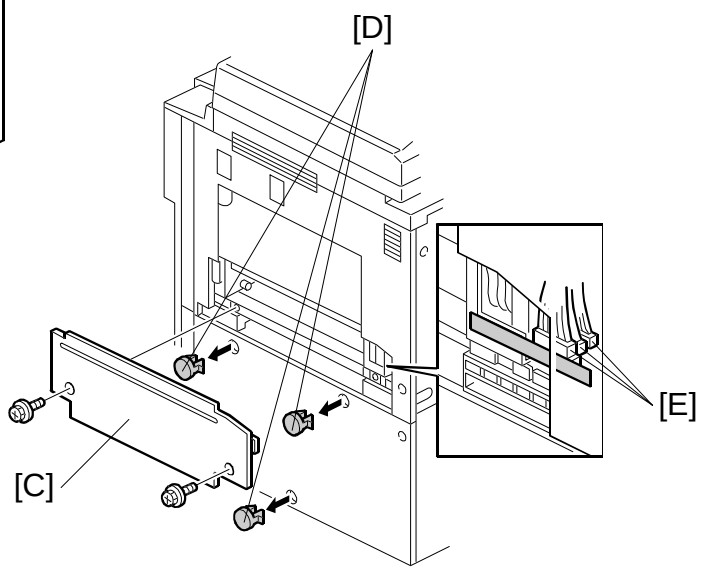
3.9.1 ACCESSORY CHECK

Description	Q'ty
1. LCT Feed Unit	1
2. Small Cap - Left Cover	1
3. Tapping Screw - M4 x 8	3
4. Philips Pan Head Screw - M4 x 16	3
5. Philips Pan Head Screw - M4 x 6	1

3.9.2 INSTALLATION PROCEDURE



A822I500.WMF

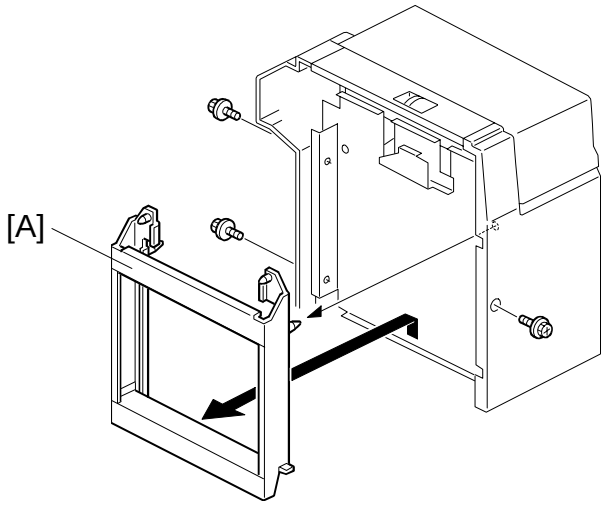


A822I501.WMF

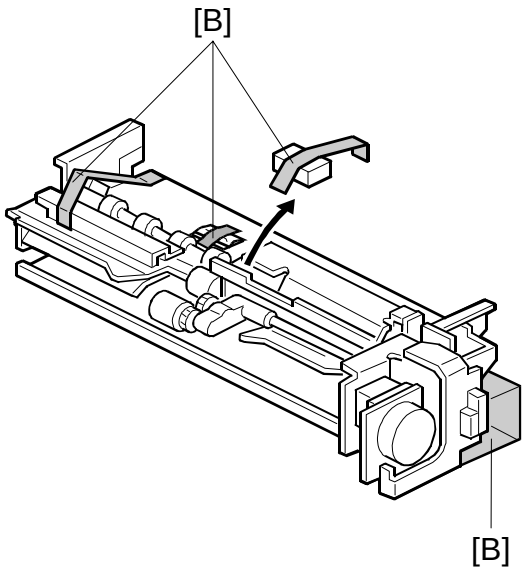
⚠CAUTION

Unplug the copier power cord before starting the following procedure.

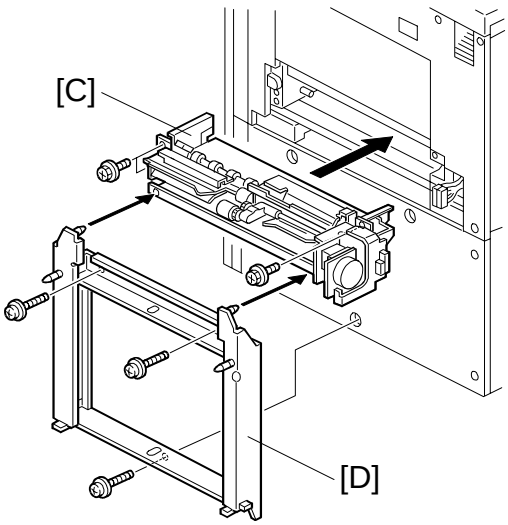
1. Open the LCT cover [A] and remove the tapes [B] fixing the paper trailing edge stopper.
2. Remove the lower by-pass cover [C].
3. Remove the 3 plastic caps [D].
4. Pull out the connector [E].



A822I502.WMF

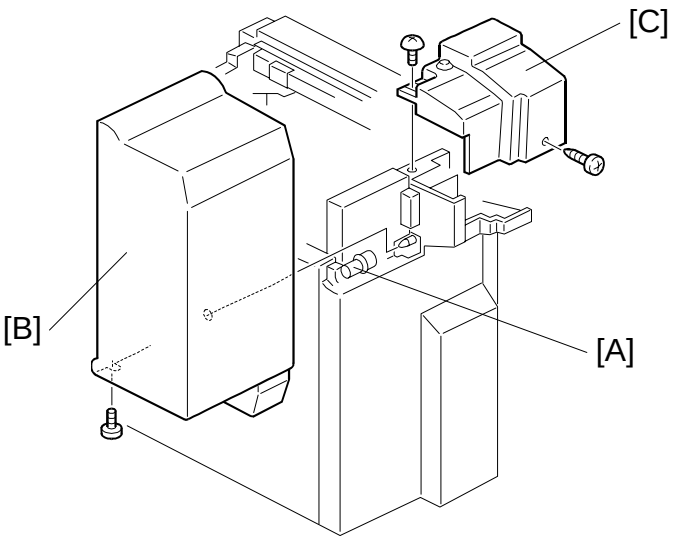


A822I503.WMF

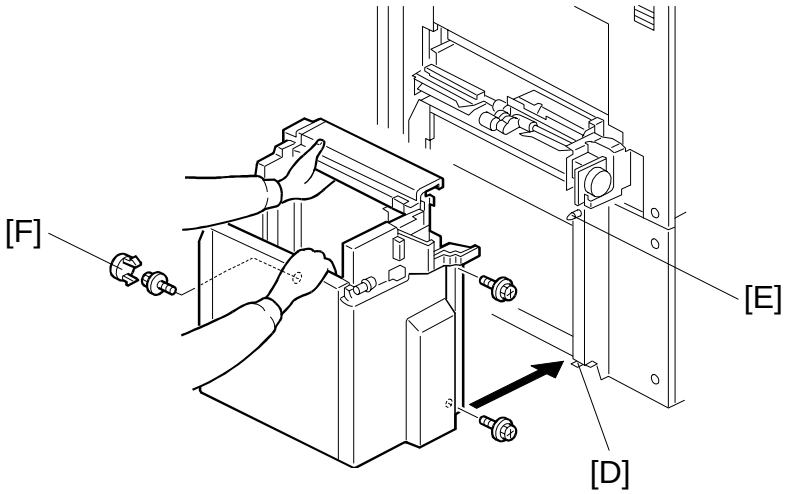


A822I504.WMF

5. Remove the LCT connector [A] (3 screws).
6. Remove the shipping retainers [B].
7. Install the LCT feed unit [C] to the copier (3 screws - M4 x 8).
8. Install the LCT connector [D] to the copier (3 screws - M4 x 16).



A822I505.WMF

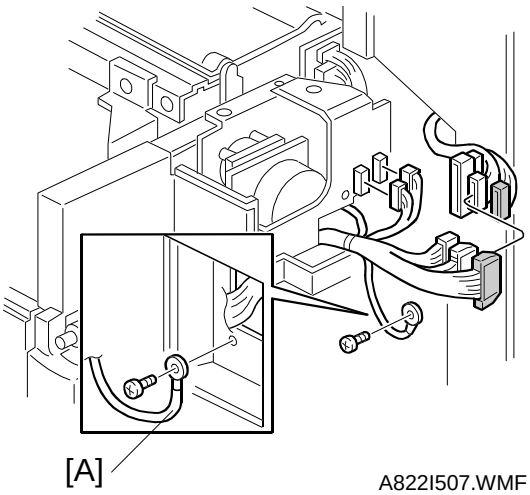


A822I506.WMF

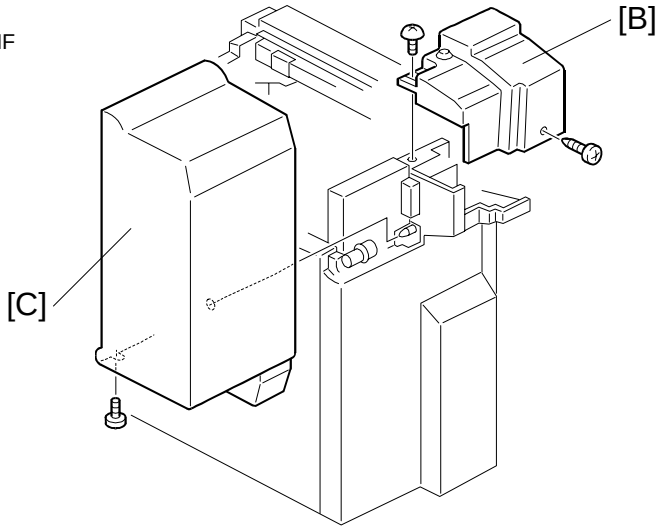
9. Remove the screw that holds the upper cover hinge [A], then slide the LCT cover [B] and remove it [B].
10. Remove the rear upper cover [C] (2 screws).
11. Hold the LCT as shown and place the LCT on the bottom plates [D] of the LCT connector.

CAUTION: Place the LCT on the bottom plate [D] of the LCT connector properly (the sides of the LCT and the copier must be parallel).

12. Insert the two pins [E] on the LCT connector into the two holes in the LCT.
13. Secure the LCT to the LCT connector (3 screws - M4 x 8).
14. Insert the cap [F] in the front screw access hole.



A822I507.WMF

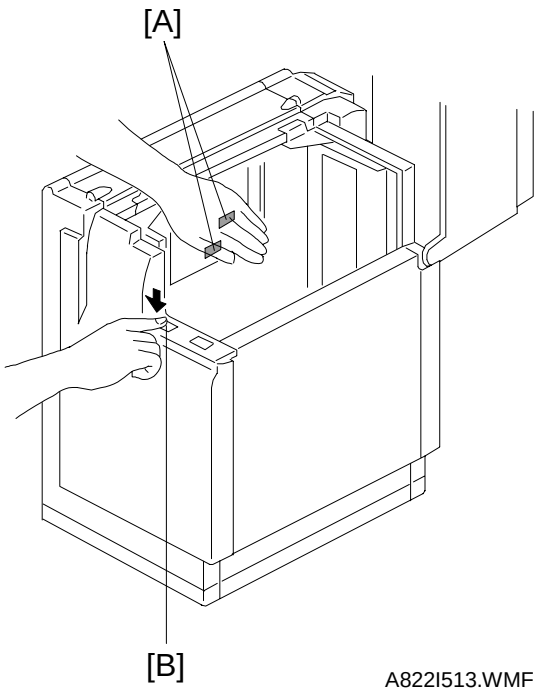


A822I505.WMF

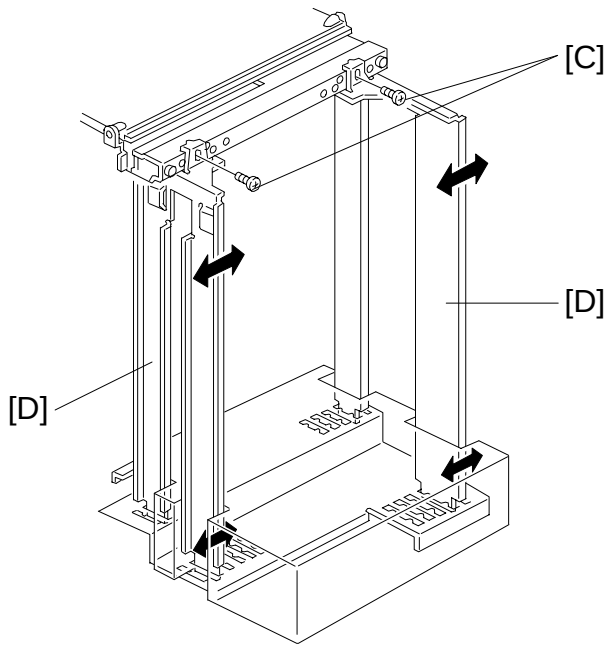
15. Connect the connectors.
16. Secure the protective earth wire [A] on the copier (1 screw - M4 x 6).
17. Install the rear upper cover [B] (2 screws).
18. Install the LCT cover [C] (1 screw).
19. Plug in the copier and check machine operation.

NOTE: The copier automatically recognizes that the LCT has been installed.

3.9.3 PAPER SIZE CHANGE



A822I513.WMF

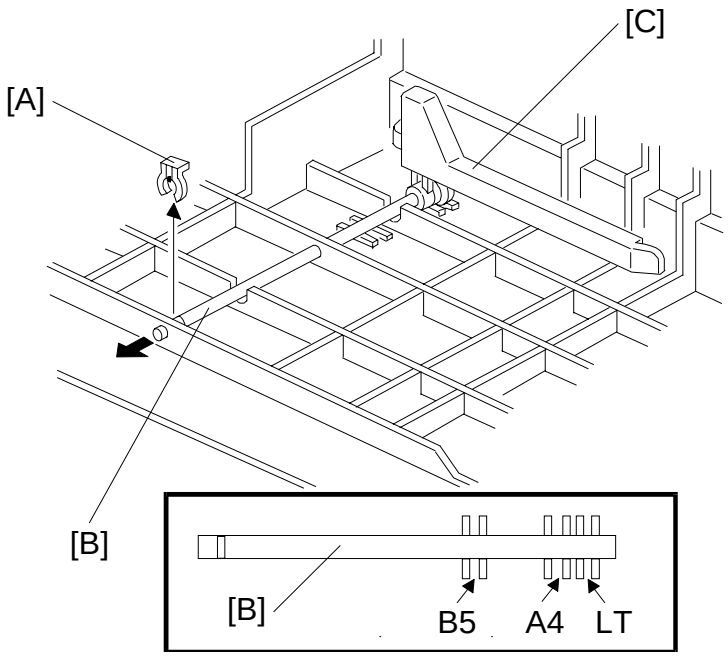


A822I514.WMF

Change the paper size, if the customer requests it.

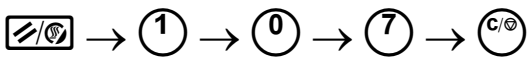
NOTE: A4/Letter sideways is the factory setting.

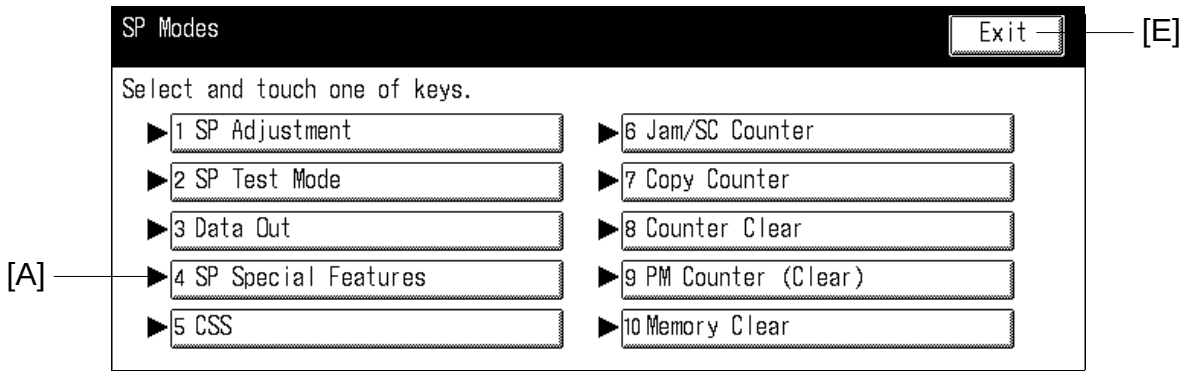
1. While covering two sensors [A] with your hand, press the tray down key [B] to lower the bottom tray.
2. Remove the screws [C] fixing the front and the rear side fences [D].
3. Tilt the side fences to the right (front view) and lift to remove.
4. Position the side fences according to the paper size.
5. Fix the side plates (1 screw each).



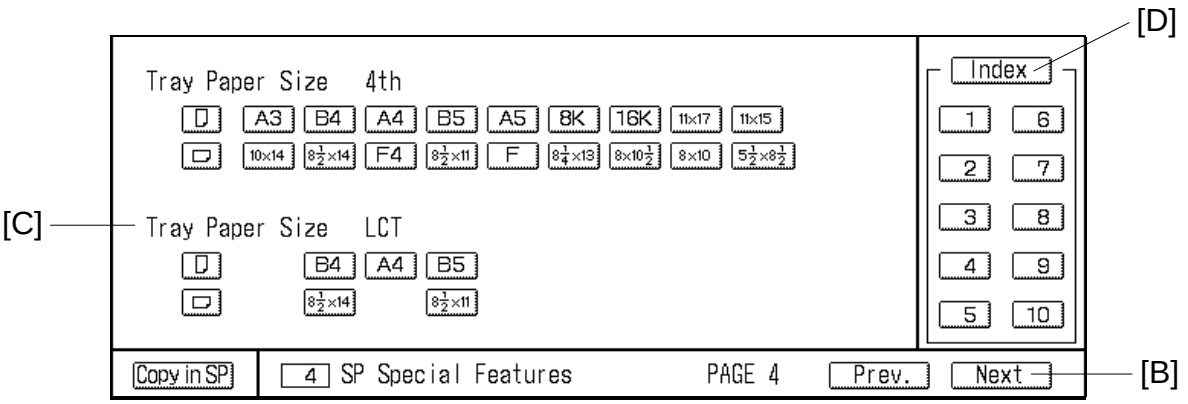
A822I515.WMF

6. Remove the clip [A] and pull out the shaft [B]. Position the paper trailing edge stopper [C] according to the paper size.
7. Re-install the shaft [B] and the clip [A].
8. Enter SP mode as follows:
   1) Press the “Clear Mode” key.
   2) Enter “107”.
   3) Touch the “Clear/Stop” key for more than 3 seconds.





A822I516.PCX



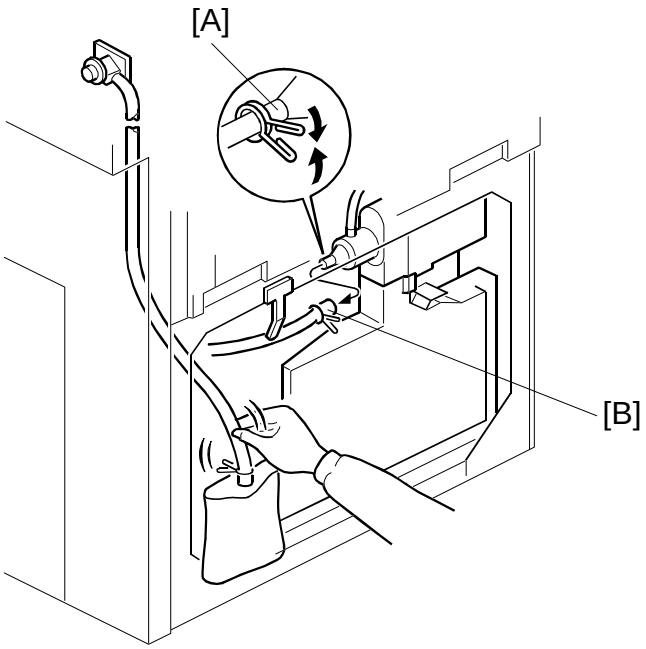
A822I512.PCX

9. Touch the “SP Special Features” key [A].
10. Touch the “Next” key [B] three times to enter SP4-4-2 (Tray Paper Size LCT), then touch the appropriate paper size of LCT [C].
11. Touch the “Index” key [D], then touch the “Exit” key [E].
12. Check the copy quality and machine operation.

3.10 TRANSPORTATION REMARKS

3.10.1 TONER RECYCLING TUBE CLEANING

NOTE: 1) When transporting the machine, perform the following operations. Otherwise the toner may be blocked.
2) When installing a new machine or transporting the machine which copied less than 1,000-sheets, these actions are not necessary.
3) Be careful not to drop the toner.



A246I531.WMF

1. Turn off the main switch.
2. Remove the lower right cover. (Refer to Lower Right Cover Removal, section 6.1.4.)
3. While unhooking the tube clip [A] disconnect the end of tube [B], as shown.
4. While putting the end of the tube into a plastic bag, unhook the tube (1 clamp), and set it vertically.
5. Tap the tube to remove the toner, as shown.
6. Reinstall the tube.

3.10.2 OTHER OPERATIONS

1. Remove the development unit and pack it.
2. Set the clamps which were removed at installation.

4. SERVICE TABLES

4.1 GENERAL CAUTIONS

Do not turn off either of the power switches while any of the electrical components are active. Doing so might cause damage to units such as the transfer belt, drum, and development unit when they are pulled out of or put back into the copier.

4.1.1 DRUM

An organic photoconductor (OPC) drum is more sensitive to light and ammonia gas than a selenium drum. Follow the cautions below when handling an OPC drum.

1. Never expose the drum to direct sunlight.
2. Never touch the drum surface with bare hands. When the drum surface is touched with a fingers or becomes dirty, wipe it with a dry cloth or clean it with wet cotton. Wipe with a dry cloth after cleaning with wet cotton.
3. Never use alcohol to clean the drum; alcohol dissolves the drum surface.
4. Store the drum in a cool, dry place away from heat.
5. Take care not to scratch the drum as the drum layer is thin and is easily damaged.
6. Never expose the drum to corrosive gases such as ammonia gas.
7. Always keep the drum in its protective sheet when out of the copier. Also always close the protective shutter on the drum unit when keeping the drum unit out of the copier. Doing so avoids exposing it to bright light or direct sunlight this will protect it from light fatigue.
8. Dispose of used drums in accordance with local regulations.
9. When installing a new drum, do the process control initial setting (SP1-2-2).

4.1.2 DRUM UNIT

1. Before pulling out the drum unit, place a sheet of paper under the drum unit to catch any spilt toner.
2. Make sure that the drum unit is set in position and the drum stay is secured with a screw before the main switch is turned on. If the drum unit is loose, poor contact of the drum connectors may cause electrical noise, resulting in unexpected malfunctions (RAM data change is the worst case).
3. To prevent drum scratches, remove the development unit before removing the drum unit.

4.1.3 CHARGE CORONA

1. Clean the corona wires with a dry cloth. Do not use sandpaper or solvent.
2. Clean the charge corona casing with water first to remove NOx based compounds. Then clean it with alcohol if any toner still remains on the casing.
3. Clean the end block with a blower brush first to remove toner and paper dust. Then clean with alcohol if any toner still remains.
4. Do not touch the corona wires with bare hands. Oil stains from fingers may cause uneven image density on copies.
5. Make sure that the corona wires are correctly positioned between the cleaner pads and that there is no foreign material (iron filings, etc.) on the casing.
6. When installing new corona wires, do not bend or scratch the wire surface to avoid any uneven charge. Also be sure that the corona wires are correctly positioned in the end blocks. (See Charge Corona Wire Replacement)
7. Clean the grid plate with a blower brush (not with a dry cloth).
8. Do not touch the charge grid plate with bare hands. Also, do not bend the charge grid plate or make any dent in it. Doing so may cause uneven charge.

4.1.4 OPTICS

1. When installing the exposure glass, make sure that the white mark on the edge of the glass face up. This side has received special treatment to make it smoother and generate less static electricity.
2. When moving the 1st and 2nd scanners, always hold them at the center. Move them slowly, carefully, and gently.
3. Do not bend or crease the exposure lamp flat cable.
4. Do not touch the following parts with bare hands:
   a) Reflectors
   b) Exposure Lamp
   c) Mirrors and lens
   d) V_D,ADS and V_L patterns
5. To clean the mirrors and lens, use only a clean soft cloth damped with alcohol or water.
6. Do not turn the vertical position adjusting cam. Adjusting the vertical lamp position is very difficult because the filament cannot be seen clearly as the lamp is frosted.
7. The mirror surface with the reflective coating must face the light pass. The spring plate must contact the reverse side of the mirror (the side without coating).
8. Because the toner shielding filter is coated with an anti-static solution (which is removed when wiped with water or alcohol) clean the toner shielding filter very gently to avoid generating static electricity, and wipe with a dry cloth.

4.1.5 ERASE LAMP

1. A narrower lead edge erase margin increases the possibility of fusing jams. The margin should be at least 1.0 mm.
2. After cleaning the erase lamp unit, rub it gently with your finger to discharge any static electricity on the unit surface.
3. Use only a dry cloth to clean the potential sensor.

4.1.6 DEVELOPMENT UNIT

1. Be careful not to nick or scratch the development roller sleeve.
2. Place the development unit on a sheet of paper after removing it from the copier. This prevents any small metal objects (staples, clips, E-ring, etc.) from being attracted to the development roller and getting inside the unit.
3. Be careful not to bend the terminals on the rear side.
4. Clean the drive gears after removing used developer.
5. Dispose of used developer in accordance with local regulations.
6. Never load different types of developer and toner into the development unit. Doing so will cause poor copy quality and toner scattering inside of the copier.
7. Developer initial setting is necessary when new developer is installed. Do not perform the developer initial setting with used developer. Do not make any copies before doing the initial setting.
8. When removing the development unit, push it to the right to prevent the drum from being scratched by part of the development unit.
9. Never disassemble the development roller assembly. The position of the doctor plate is set with special tools and instruments at the factory to ensure the proper gap between the doctor blade and the development roller. Do not loosen any screws covered with white paint.
10. Before pulling out the development unit, disconnect two connectors.
11. When pulling out the development unit, do not pull the knob.
12. When setting the development unit in the machine, do not forget to connect the two connectors.

4.1.7 TRANSFER BELT UNIT

1. Never touch the transfer belt surface with bare hands.
2. Take care not to scratch the transfer belt, as the surface is easily damaged.
3. Apply setting powder or toner to the new cleaning blade.
4. Before installing the new transfer belt, clean all the rollers and the inner part of the transfer belt with a dry cloth to prevent the belt from slipping.

4.1.8 CLEANING SECTION

1. When servicing the cleaning section, be careful not to damage the edge of the cleaning blade.
2. Do not touch the cleaning brush with bare hands.
3. Before disassembling the cleaning section, place a sheet of paper under it to catch any toner falling from it.
4. Apply setting powder to the new cleaning blade.

4.1.9 PRE-TRANSFER LAMP

1. After cleaning the pre-transfer lamp filter, rub it gently with your finger to discharge any static electricity on the filter.

4.1.10 PAPER FEED

1. Do not touch the surface of the pick-up, feed, and separation rollers and friction pads with bare hands.
2. To avoid paper misfeeds, the side fences and end fence of the paper tray must be positioned correctly to align with the actual paper size.
3. Be careful when reinstalling the paper feed (pick-up, feed, separation) in the paper tray unit. They are not interchangeable with feed rollers of the by-pass feed tray and 3.5 k LCT because the feeding direction is different.

4.1.11 FUSING UNIT

1. Be careful not to damage the edges of the hot roller strippers or their tension springs.
2. Do not touch the fusing lamp and rollers with bare hands.
3. Make sure that the fusing lamp is positioned correctly and that it does not touch the inner surface of the hot roller.
4. Level the oil supply roller while it is stored, otherwise the silicone oil in the oil supply roller comes out from the lowest part.
5. Silicon oil may slightly soak into the surface of the hot roller during machine storage. The silicon oil may stick to the surface of the pressure roller when the hot roller was in contact with the pressure roller at installation. The pressure roller may slip due to the oil because the hot and pressure rollers are new. Therefore, the smeared image may appear on the leading edge at about 10 mm on the 1st copy. This is because the hot roller is rubbing the leading edge of the copy on the pressure roller. This symptom occurs only at the 1st copy after installation. Make sample copies and make sure that the symptom does not recur after several copies.

4.1.12 USED TONER

1. Recommend checking the amount of used toner at every EM.
2. Dispose of used toner in accordance with local regulations. Never throw toner into an open flame, for toner dust may ignite.

4.2 SERVICE PROGRAM MODE

4.2.1 SERVICE PROGRAM MODE OPERATION

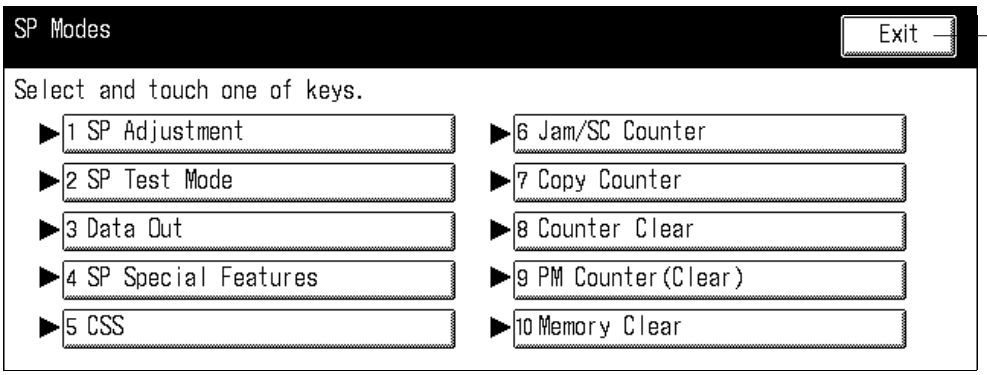
The service program (SP) mode is used to check electrical data, change modes, and adjust values.

Service Program Access Procedure

1. Press the following keys in sequence.

   [#/P] → [1] → [0] → [7] → [C/Stop]

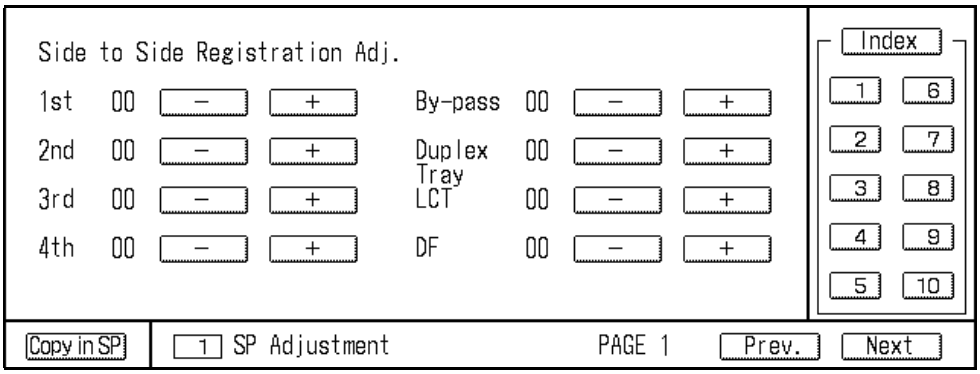
   NOTE: Hold the “Clear/Stop” key for more than 3 seconds.
2. A menu of SP modes is displayed on the LCD.
3. Touch the application which you need.



A246M500.PCX

Exiting SP mode

1. Touch the “Exit” [A] key to return to the standby mode display.



A246M563.PCX

Return to the index menu

1. Touch the “Index” key.

Change the menu screen

1. To move the next page, touch “Next” key.
2. To move the next page, touch “Prev.” key.

NOTE: For the adjustments for which the setting are entered by using “–” “+”, the defalt value is “00”.

Accessing Copy Mode from within an SP Mode

1. Touch the “Copy in SP” key.
2. Select the appropriate copy mode and make trial copies.
3. To return to the SP mode, touch the “SP mode” key.

4.2.2 SERVICE PROGRAM MODE TABLES

Table

SP Mode No.		Function
1 SP Adjustment		
	1-1-1	Side to Side Registration Adjustment
	1-2-1	Developer Initial Setting
	1-2-2	Process Control Initial Setting
	1-2-3	Leading Edge Registration Adj.
	1-2-4	Leading Edge Erase Adjustment
	1-3-1	Vertical Magnification Adj.
	1-3-2	Horizontal Magnification Adj.
	1-3-3	Lens Error Correction
	1-3-4	Focus Adjustment
	1-4-1	Factory Use-D
	1-4-2	Factory Use-P
	1-4-3	Factory Use-L
	1-5-1	DF Registration Adj. (1st, Thin)
	1-5-2	DF 2nd side Registration Adj.
	1-5-3	DF Registration Adj. (1st, Thick)
	1-5-4	Original Distance Adj. (Comb.)
	1-6-1	Paper Feed Timing
	1-7-1	Jogger Span Adjustment
	1-8-1	Positioning Roller OFF
	1-9-1	Paper Size Correct. (By-pass feed)
	1-9-2	Positioning Roller ON
	1-10-1	APS Size Calibration
	1-10-2	Scanner Motor Gain Adjustment
	1-10-3	Optics Side Registration Adjustment
	1-10-4	Duplex Jogger Home Position Adjustment
	1-11-1	Staple Position Adjustment
	1-11-2	Punch Hole Position Adjustment
	1-12-1	Auto Process Control
	1-12-2	Grid Voltage Adjustment
	1-12-3	Development Bias Adjustment
	1-12-4	Exposure Lamp Adjustment : 0.5V Step
	1-13-1	Toner Supply Mode
	1-13-2	Factory Use-T
	1-13-3	Toner Supply Ratio (Fix Mode)
	1-13-4	Character Thin Line Adjustment (Generation Copy Mode)
	1-14-1	Charge Wire Cleaner
	1-14-2	Tfr V Correction
	1-14-3	Tfr Current Set (1st)
	1-14-4	Tfr Current Set (2nd)
	1-15-1	Fusing Idling Period Selection
	1-15-2	Fusing Temperature Adjustment
	1-15-3	ID Sensor Initial Setting
	1-15-4	Auto ADS Initial Setting
	1-16-1	VP Auto Shift
	1-17-1 ~ 10	Not Used

SP Mode No.		Function
2 SP Test Mode		
	2-1-1	Free Run Mode
	2-1-2	Free Run Mode (Lamp OFF)
	2-1-3	DF Free Run Mode
	2-1-4	Sorter Free Run Mode
	2-2-1	Toner Density Recovery
	2-2-2	Toner Correction Mode
	2-2-3	Jam Detection OFF Mode
	2-3-1	Paper Size Detection (By-pass Feed)
	2-3-2	APS Confirmation
	2-3-3	APS Beam 1 Original Detection
	2-3-4	APS Beam 2 Original Detection
	2-4-1	Input Check
	2-4-2	Output Check
3 Data Out		
	3-1-1	Drum Surface Potential
	3-1-2	Grid Voltage
	3-1-3	Development Bias Volt.
	3-1-4	Exposure Lamp Volt.
	3-2-1	Toner Sensor Output
	3-2-2	ID Sensor Output
	3-2-3	Grid Volt. (M-CH)
	3-2-4	Current Toner Mode
	3-2-5	Toner Supply Level
	3-2-6	Transfer Voltage
	3-3-1	ADS Sensor Present Measurement
	3-3-2	Fusing Temperature
	3-3-3	Drum Temperature
	3-3-4	Optics Unit Temperature
4 SP Special Features		
	4-1-1	Serial No.
	4-2-1	Service Telephone No.
	4-2-2	ROM Part Number
	4-3-1	Tray Paper Size 1st
	4-3-2	Tray Paper Size 3rd
	4-4-1	Tray Paper Size 4th
	4-4-2	Tray Paper Size LCT
	4-5-1	Staple Mode Cancellation After Staple Job is finished
	4-5-2	Staple Mode Enable in Stack Mode
	4-5-3	Staple Key Indication
	4-6-1	Fusing Lower Temp. Limit
	4-6-2	Paper Size Selection : Lens Position in APS Mode
	4-6-3	Trailing Edge Erase – Duplex 2nd
	4-7-1	A3/DLT Double Count (Up/Down)
	4-7-2	A3/DLT Double Count (Set/Reset)
	4-7-3	Input Unit Selection
	4-7-4	Auto Erase Border in Book Mode
	4-8-2	Enable Auto Reset Function at key Card/Counter Removal
	4-8-4	APS Key Indication

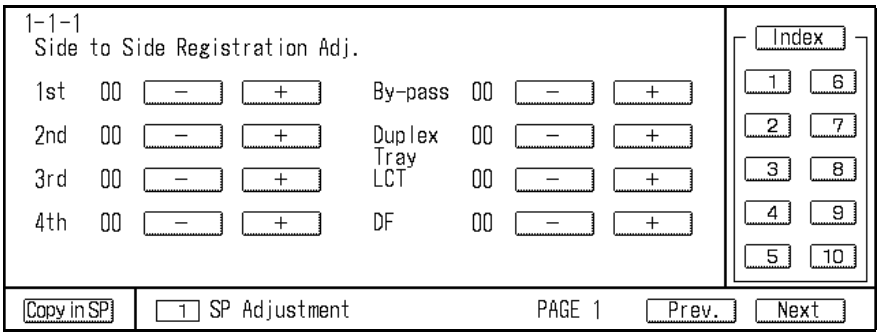
SP Mode No.		Function
	4-9-1	User Code Mode
	4-9-2	Access Code
	4-9-3	PM Counter ON
	4-9-4	PM Alarm Set
	4-10-1	Auto Feed Out
	4-10-2	Duplex · Sorter Enable : By-pass
	4-11-1	Stapler Limit
	4-11-2	Sort/Stack Limit
	4-11-3	Sort Bin Block Separation
	4-11-4	Staple Bin Select
	4-12-2	Taiwanese Paper Size (8K&16K) Enable
	4-13-2	Original Size Detection (F4, 8½x11 lengthwise, 8½x14)
	4-14-1	Auto Response Sensor Enable
	4-14-2	Process Control Auto Start Mode After 24 Hours Machine On
	4-14-3	CPM Selection
5 CSS		
	5-1-1	Customer Engineer Report Call to Center
	5-1-2	CSS Enable
	5-2-1	Jam Alarm Level
	5-2-2	SC Alarm Level
	5-2-3	CSS Emergency Call Enable Except For SC Alarm
	5-3-1	Consumed Supply Report
6 Jam/SC Counter		
	6-1-1	Total SC
	6-1-2	SC Counter
	6-2-1	Total Jams
	6-2-2	Total Copier Jams
	6-2-3	No. of Jams by Location
	6-3-1	No. of Copier Jams by Feed Station
	6-3-2	Total No. of Original Jams
	6-3-3	No. of DF Jams by Location
7 Copy Counter		
	7-1-1	Operation Time
	7-1-2	DF Original Counter
	7-1-3	Total Copy
	7-1-4	Total Copies by Paper Size
	7-1-5	Total Copies by Magnification
	7-2-1	Total Copies by Edit Image Modes
	7-2-2	Total Copies by Copy Modes
	7-3-1	Consumable Counter
	7-3-2	Total No. of Staple by Position
	7-3-3	Punch
	7-3-4	Total Copies by Feed Station
8 Counter Clear		
	8-1-1	SC Counter
	8-1-2	Paper Jam
	8-1-3	Original Jam

SP Mode No.		Function
	8-1-4	Copy Counter
	8-2-1	Counter Clear
	8-2-2	Total Counter Clear
9 PM Counter (Clear)		
	9-1-1	PM Counter
	9-1-2	Scanner
	9-1-3	Drum
	9-1-4	Cleaning Brush/Blade
	9-2-1	1st Feed Unit
	9-2-2	2nd Feed Unit
	9-2-3	3rd Feed Unit
	9-2-4	4th Feed Unit
	9-3-1	LCT
	9-3-2	By-pass Feed Table
	9-3-3	Duplex Unit
	9-3-4	Total No. of Original Feed by DF
	9-4-1	Charge Corona Wire/Cleaner
	9-4-2	Transfer Belt
	9-4-3	Charge Grid
	9-4-4	Transfer Belt Cleaning Blade
	9-5-1	Hot Roller
	9-5-2	Pressure Roller
	9-5-3	Hot Roller Stripper
	9-5-4	Toner Collection Tank
10 Memory Clear		
	10-1-1	Memory All Clear
	10-1-2	Operation Mode Setting Clear

Detail

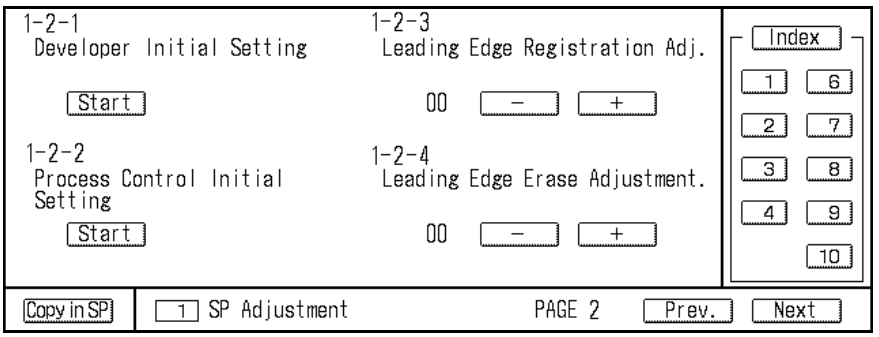
1 SP ADUSTMENT

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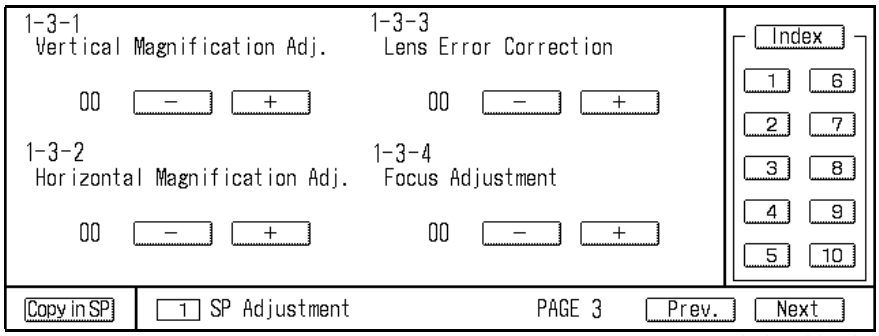


A246M502.PCX

SP No.	Function	Note
1-1-1	Adjust the lens horizontal stop position for each paper feed station. (0.1 mm/step) Adjust the lens horizontal stop position to compensate for variations in the side to side positioning of the original (DF)	4th is not used.
1-2-1	Both the TD sensor toner supply target voltage (VREF) and the TD sensor gain value are set automatically by using new developer.	With new developer, do not make any copy before performing the developer initial setting. This mode is required when new developer is installed or the TD sensor is replaced.
1-2-2	Starts the process control initial data setting.	Perform this program when the following parts have been replaced (or cleaned). Drum potential sensor/Exposure lamp/ Drum/Charge corona wire and casing/ Mirrors/Lamp around the drum/ Charge P.P./RAM etc.
1-2-3	Changes the On timing of the registration motor. (0.5 mm/step)	**Adjustment standard:** 0 ± 2 mm
1-2-4	Changes the Off timing of the erase lamp to adjust the leading edge erase margin. (0.5 mm/step)	**Adjustment standard:** 3.5 ± 2.5 mm

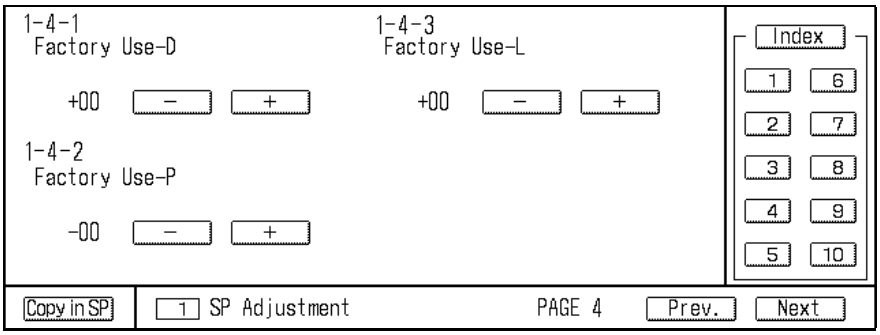
1 SP ADUSTMENT

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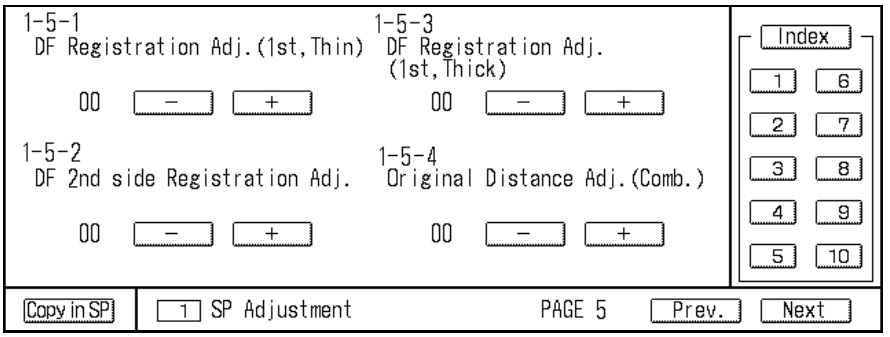


A246M504.PCX

SP No.	Function	Note
1-3-1	Adjust magnification in the paper feed direction by adjusting the scanner motor speed. (0.1 %/step)	Perform this adjustment when the optics control board has been replaced. **Adjustment standard:** 100 ± 1 %
1-3-2	Adjust magnification perpendicular to the direction of the paper feed. The lens position in the full size mode is changed. (0.1 %/step)	Perform this adjustment when the optics control board has been replaced. **Adjustment standard:** 100 ± 1 %
1-3-3	Adjust the lens position to correct focus in enlarge/reduce modes. (0.1 %/step)	Input only the value marked on the lens.
1-3-4	Adjust the 3rd scanner home position to correct the focus.	
1-4-1	Factory use only.	Do not change the setting in the field.
1-4-2	Factory use only.	Do not change the setting in the field.
1-4-3	Factory use only.	Do not change the setting in the field.

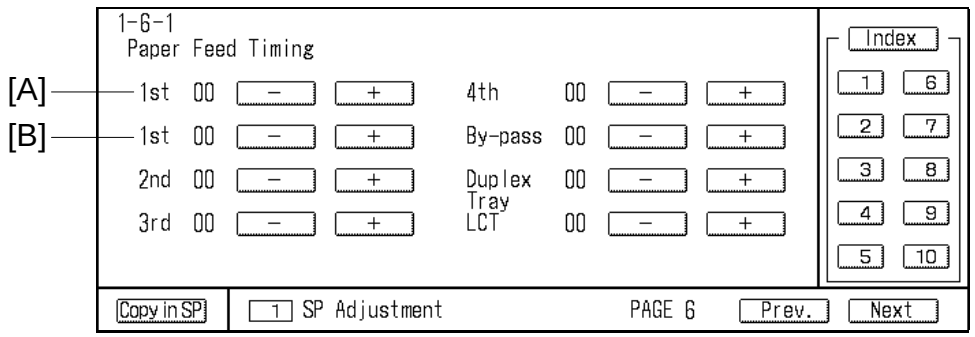
1 SP ADUSTMENT

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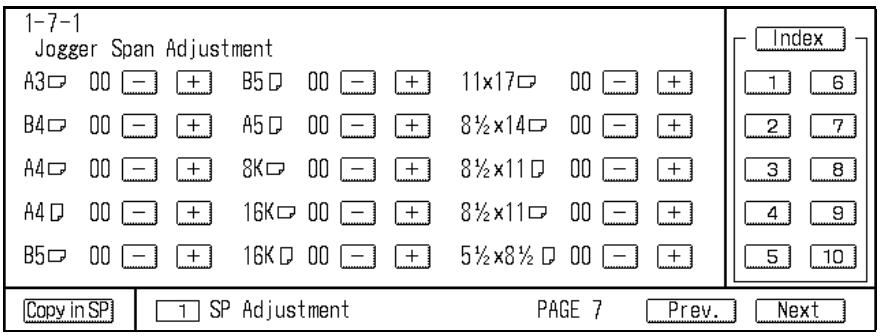


A246M506.PCX

SP No.	Function	Note
1-5-1	Adjust the original stop position (thin original mode) against the original side scale in one-sided original mode. (0.5 mm/step)	
1-5-2	Adjust the original stop position against the original side scale in two-sided original mode. (0.5 mm/step)	
1-5-3	Adjust the original stop position (thick original mode) against the original side scale in one-sided original mode. (0.5 mm/step)	
1-5-4	Adjust the gap between the 1st original and 2nd original in combine 2 original mode. (1.7 mm/step)	
1-6-1	Change the paper feed clutch on timing to adjust the paper buckle at the registration roller. (1 mm/step)	Refer to the paper feed timing adjustment in section 6. [A] First paper feed clutch On timing at the first copy. (A246 only) [B] First paper feed clutch On timing after the first copy. 4th is not used.

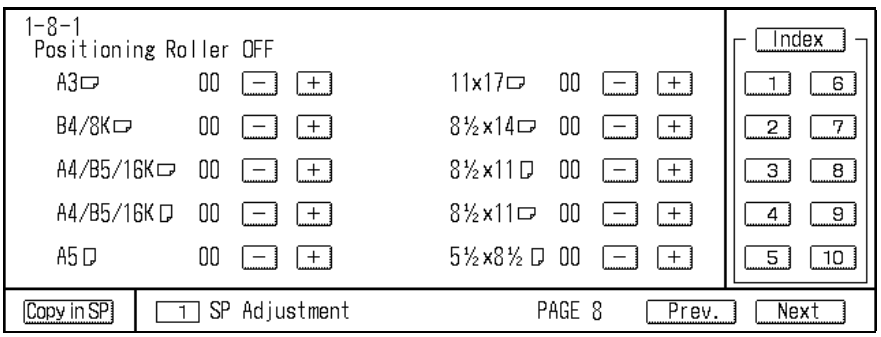
1 SP ADUSTMENT

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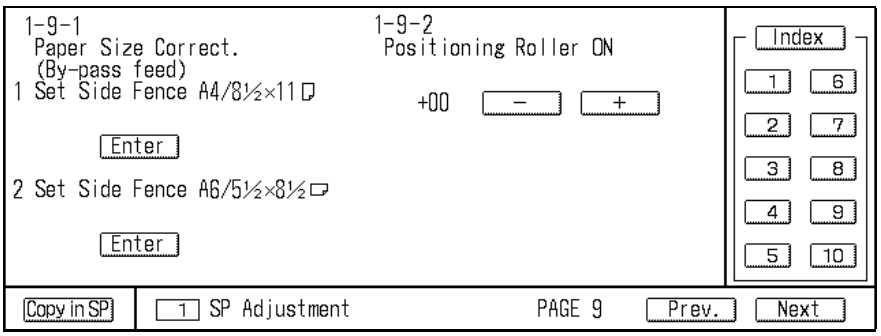


A246M508.PCX

SP No.	Function	Note
1-7-1	Adjust the duplex jogger fence position for each paper size. (0.3 mm/step)	Press "+" to decrease the distance between the side fences. Press "–" to increase the distance between the side fences. **Procedure:** 1. Enter SP mode then press "Copy in SP". **Note:** Press "Copy in SP" after changing the setting to correctly store the changed setting in memory. If not, sometime the setting will not be stored in memory. 2. Feed a sheet of paper to the duplex tray. 3. Take out the duplex unit then check the paper and jogger fence position. 4. Return to SP mode (touch "SP mode" key). 5. Touch the "+" or "–" key to adjust the jogger fence position so that the distance between fences becomes 1 mm wider than the paper width.
1-8-1	Changes the duplex positioning roller up timing to adjust the paper buckle at the separation roller (5 ms/step).	Adjust the timing so that the paper leading edge just touches the separation belt without any buckle.

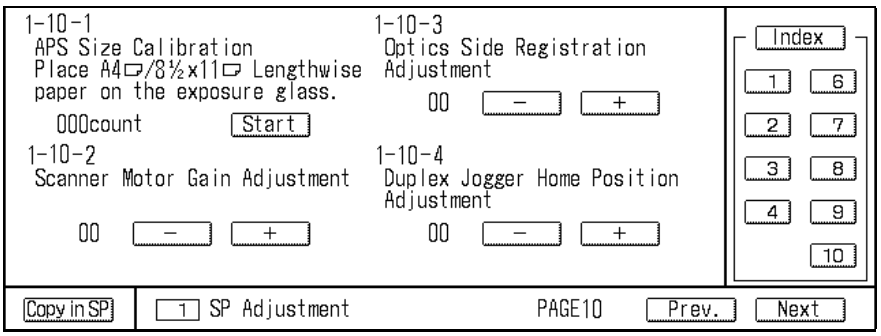
1 SP ADUSTMENT

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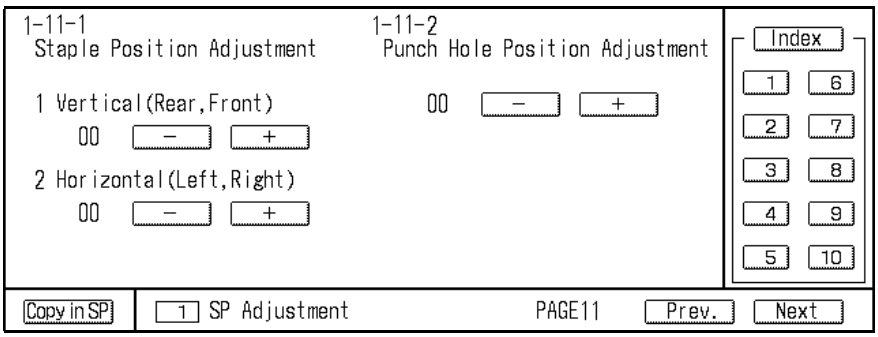


A246M510.PCX

SP No.	Function	Note
1-9-1	Initializes the by-pass paper size sensor.	**Procedure:** 1. Set the by-pass table side fence to the A4/81/2 x 11 position, then touch the “Enter” key. 2. Set the by-pass table side fence to the A6/51/2 x 81/2 position, then touch the “Enter” key. Perform this mode when the by-pass paper size sensor has been replaced.
1-9-2	Changes the duplex positioning roller down timing. (5 ms/step)	Perform this mode when duplex paper jam caused by incorrect paper stack in the duplex unit is occurred.
1-10-1	Initializes the APS sensor.	Perform this mode when APS sensor has been replaced or re-installed.
1-10-2	Factory use only.	Do not change the setting.
1-10-3	Factory use only.	Do not change the setting.
1-10-4	Factory use only.	Do not change the setting.

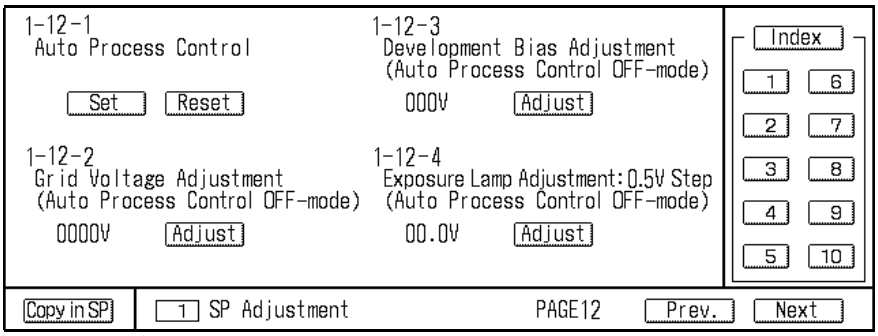
1 SP ADUSTMENT

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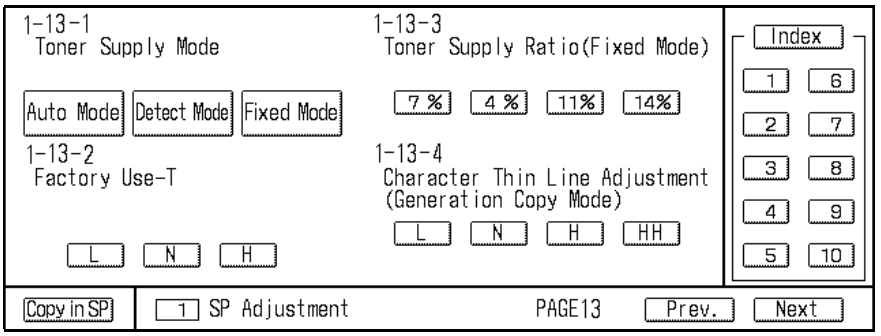


A246M512.PCX

SP No.	Function	Note
1-11-1-1	Adjusts the vertical staple position. (0.5 mm/step)	
1-11-1-2	Adjusts the horizontal staple position. (0.5 mm/step)	
1-11-2	Adjusts the vertical punch holes position. (1 mm/step)	
1-12-1	Enables and disables the auto process control (V_R, V_L, V_D corrections). **Default:** Set	Normally select “Set”. Select “Reset” only to check if the cause of the problem is related to process control or not.
1-12-2	Inputs the grid bias voltage when auto process control is disabled or after RAM is cleared. (1 V/step) **Default:** 870 V	Touch “Adjust” key and enter the setting using the number keys, then touch “#”. This data is used when the Auto Process Control is disabled (SP1-12-1) is selected to “Reset”.
1-12-3	Inputs the development bias voltage when auto process control is disabled or after RAM is cleared. (1 V/step) **Default:** 220 V	Touch “Adjust” key and enter the setting using the number keys, then touch “#”. This data is used when the Auto Process Control is disabled (SP1-12-1) is selected to “Reset”.
1-12-4	Inputs the exposure lamp voltage when auto process control is disabled or after RAM is cleared. (0.5 V/step) **Default:** 65.0 V	Touch “Adjust” key and enter the setting using the number keys, then touch “#”. This data is used when the Auto Process Control is disabled (SP1-12-1) is selected to “Reset”.

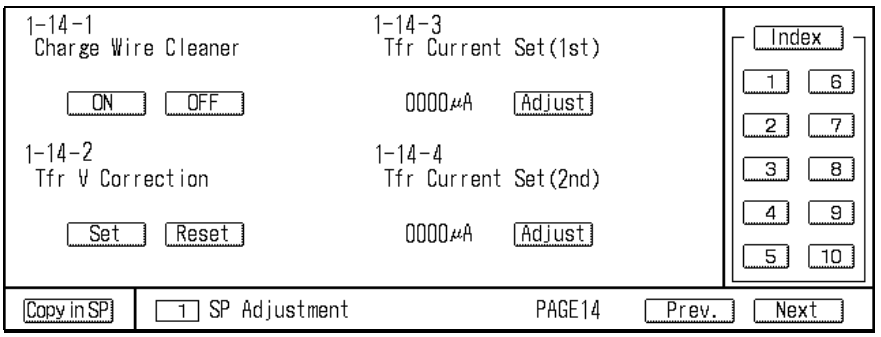
1 SP ADUSTMENT

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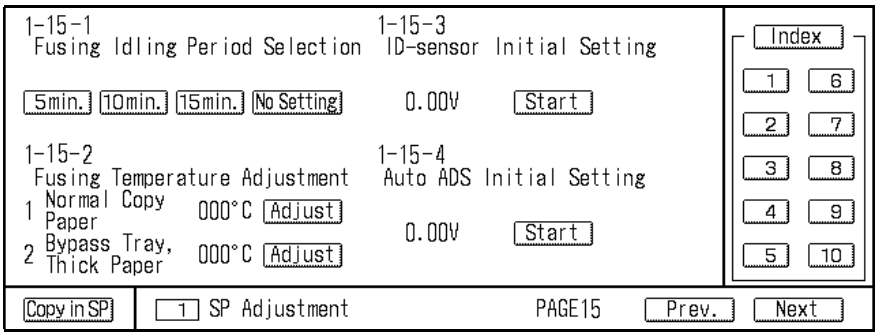


A246M514.PCX

SP No.	Function	Note
1-13-1	Selects toner supply mode. **Default:** Auto Mode	Select “Auto Mode” in the field.
1-13-2	Factory use only.	Select “N” in the field
1-13-3	Changes the toner supply ratio in fix toner supply mode. **Default:** 4%	Be careful, there is no overtoning protection system.
1-13-4	Adjusts the thickness of the character mainly in generation copy mode.	**L:** Thick ↔ **HH:** Thin
1-14-1	Selects the charge wire cleaner motor operation when perform the process control Initial setting. **Default:** ON	
1-14-2	Selects whether or not the transfer voltage detected in the process control data initialization is used for compensation of transfer current output control for the duplex feed. **Default:** Set	Duplex feed compensation for the transfer current output. **H:** Tfr current setting (2nd) x 1.0 x paper size compensation **M:** Tfr current setting (2nd) x 0.9 x paper size compensation **L:** Tfr current setting (2nd) x 0.8
1-14-3	Adjusts the transfer current for the 1st side (1 μA/step) **Default:** 40 μA (A246), 45 μA (Others)	Touch “Adjust” key and enter the setting using the number keys, then touch “#”.
1-14-4	Adjusts the transfer current for the 2nd side (1 μA/step) **Default:** 50 μA (A246), 55 μA (Others)	Touch “Adjust” key and enter the setting using the number keys, then touch “#”.

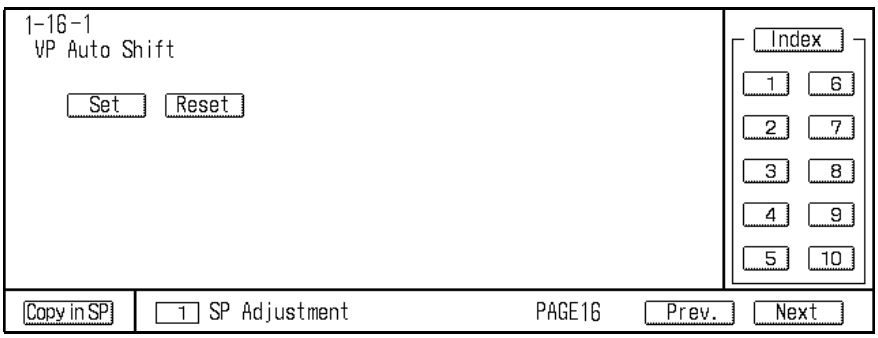
1 SP ADUSTMENT

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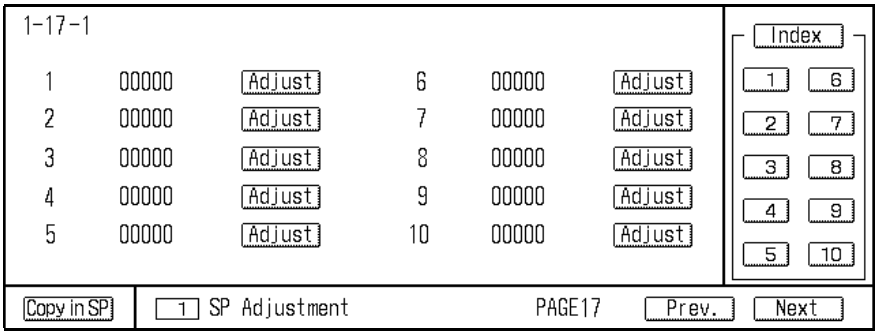


A246M516.PCX

SP No.	Function	Note
1-15-1	Increases the period to sufficiently heat the pressure roller at power on. **Default:** 5min.	Perform this only if poor fusing occurs just after the power is turned on.
1-15-2	Adjusts the fusing temperature. (1°C/step). **Default:** 185°C (Normal copy paper), 190°C (Thick paper mode)	Increase only when poor fusing occurs. **Procedure:** 1. Touch “Adjust” key. 2. Enter the appropriate number by using the number keys. 3. Press the “#” key.
1-15-3	Adjusts V_{SG} to 4.0 ± 0.2 V	This mode is also performed during the process control data initial setting.
1-15-4	Adjusts the ADS sensor output to 2.7 ± 0.1 V while scanning the ADS pattern.	This mode is also performed during the process control data initial setting.
1-16-1	Selects the VP correction mode. **Default:** Set	

1 SP ADUSTMENT

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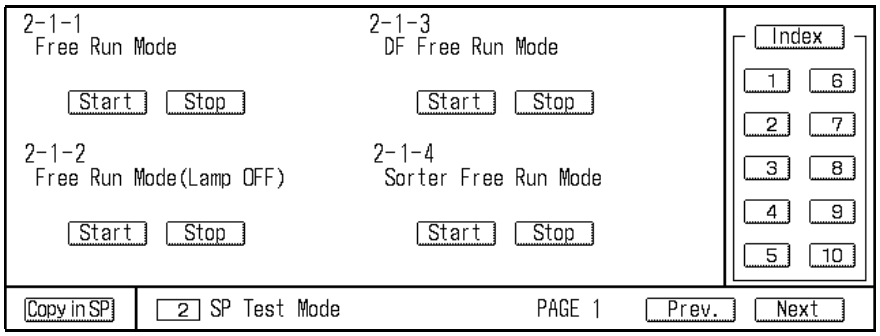


A246M565.PCX

SP No.	Function	Note
1-17-1	Not Used	
1-17-2	Not Used	
1-17-3	Not Used	
1-17-4	Not Used	
1-17-5	Not Used	
1-17-6	Not Used	
1-17-7	Not Used	
1-17-8	Not Used	
1-17-9	Not Used	
1-17-10	Not Used	

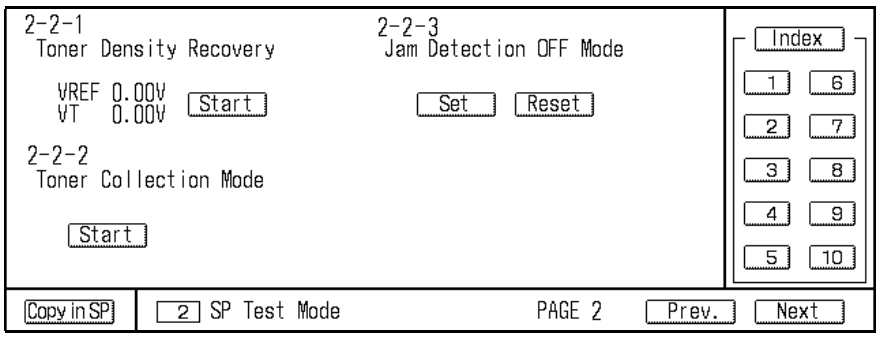
2 SP TEST MODE

PAGE 1



A246M517.PCX

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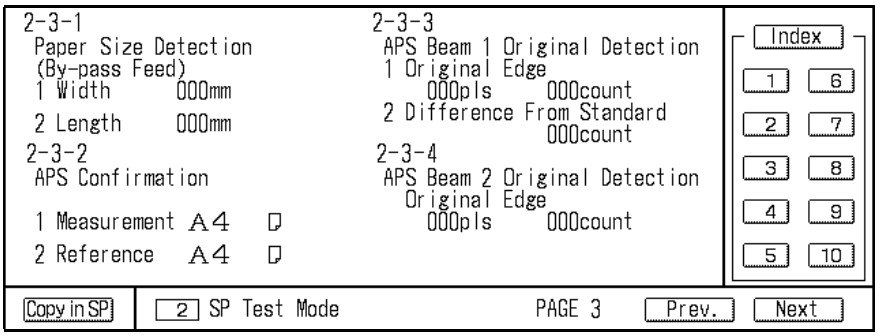


A246M518.PCX

SP No.	Function	Note
2-1-1	Operates the copier without feeding paper.	Place sheet of white paper (A3/11"x17") on the exposure glass.
2-1-2	Operates the copier without feeding paper and turning on the exposure lamp.	Do not operate the machine in this mode for a long time because a lot of toner is used.
2-1-3	Operates the DF without copier operation.	Set the original to the original tray.
2-1-4	Operates the Sorter without copier operation.	
2-2-1	Rotates the main and development motors and turns on the toner supply clutch to supply toner to the development unit. The TD sensor toner supply target voltage (VREF) and detected voltage (VT) are indicated.	Toner is supplied under the following conditions. 1. Toner supply ratio: 25% 2. Repeats 0.5 s ON and 1.5 s OFF. 3. Continues for 30 s. Check the image after this SP mode is completed.
2-2-2	Operates the toner collection drive mechanism.	After touching the "Start" key, the main motor and the toner collection motor turns on for 1 minute.
2-2-3	Disables jam detection. (Not effective for peripherals.)	This mode is only effective in the "Copy in SP" mode.

2 SP TEST MODE

PAGE 3

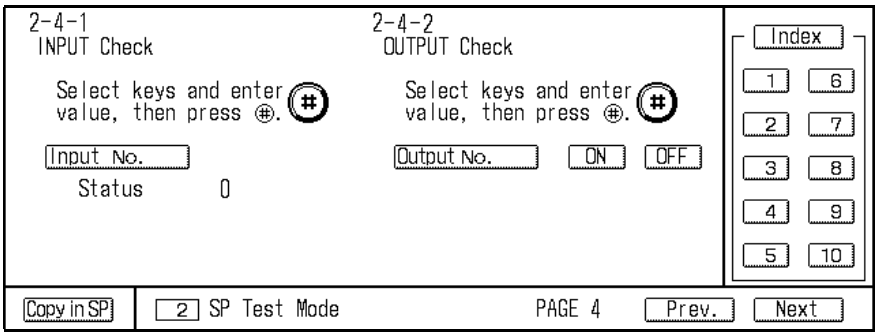


A246M519.PCX

SP No.	Function	Note
2-3-1-1	Indicates the paper width detected by the by-pass paper size sensor.	
2-3-1-2	Indicates the paper length detected by the registration sensor.	
2-3-2-1	Indicates the original size detected by APS sensor.	Place a sheet of paper on the exposure glass and close the DF or platen cover.
2-3-2-2	Indicates the original size detected by APS sensor when closing the DF or platen cover. (This data is used as original size.)	
2-3-3-1	Indicates pulses and counts detected by APS sensor.	Place a sheet of paper on the exposure glass and close the DF or platen cover.
2-3-3-1	Indicates the difference between detected counts and standard value.	
2-3-4	Indicates pulses and counts detected by APS sensor.	Place a sheet of paper on the exposure glass and close the DF or platen cover.

2 SP TEST MODE

PAGE 4

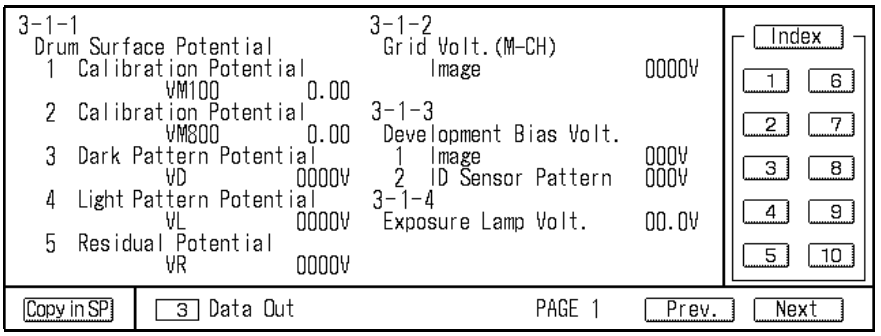


A246M520.PCX

SP No.	Function	Note
2-4-1	Use to check if the sensor or switches are correctly activated and de-activated.	**Procedure:** 1. Touch “Input No.” key. 2. Enter the sensor/switch/signal number by using the number keys on the operation panel. (Refer to 4.2.3 INPUT CHECK) 3. Touch “#” key. Status 0 ---- de-activate (no paper) Status 1 ---- activate (paper)
2-4-2	Use to check that the copier electrical components are functioning properly.	**Procedure:** 1. Touch “Output No.” key. 2. Enter the electrical component number by using the number keys on the operation panel. (Refer to 4.2.4 OUTPUT CHECK) 3. Touch “#” key. 4. Touch “ON” to activate and touch “OFF” to de-activate the electrical component.

3 DATA OUT

PAGE 1

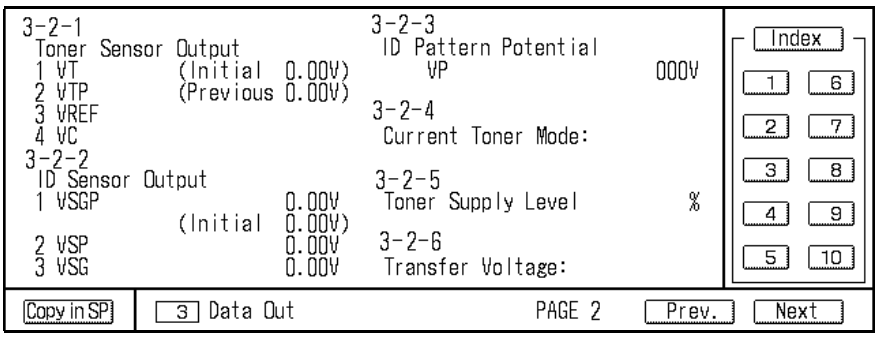


A246M521.PCX

SP No.	Function	Note
3-1-1-1	Indicates the drum potential sensor output when –100 V is applied to the drum.	**Standard**: 0.1 ~ 1.6 V
3-1-1-2	Indicates the drum potential sensor output when –800 V is applied to the drum.	**Standard**: 2.3 ~ 5.0 V
3-1-1-3	Indicates the drum potential when detecting the V_D pattern.	**Standard**: V_R + 770 ± 20 V
3-1-1-4	Indicates the drum potential when detecting the V_L pattern.	**Standard**: V_R + 140 ± 20 V
3-1-1-5	Indicates the drum potential when detecting the bare drum surface.	**Standard**: 0 ~ 200 V
3-1-2	Indicates the charge corona grid bias voltage decided during process control data initial setting.	Work only when auto process control is enabled. (See SP 1-12-1) **Standard**: 700 ~ 1,200 V
3-1-3-1	Indicates the development bias voltage decided during process control data initial setting.	Work only when auto process control is enabled. (See SP 1-12-1) **Standard**: V_R + (–220) V
3-1-3-2	Indicates the ID sensor bias voltage decided during process control data initial setting.	Work only when auto process control is enabled. (See SP 1-12-1) **Standard**: SP3-2-3 + VP – 300 V
3-1-4	Indicates the exposure lamp voltage (ID level 5) decided during process control data initial setting.	Work only when auto process control is enabled. (See SP 1-12-1) **Standard**: 50 ~ 80 V

3 DATA OUT

PAGE 2

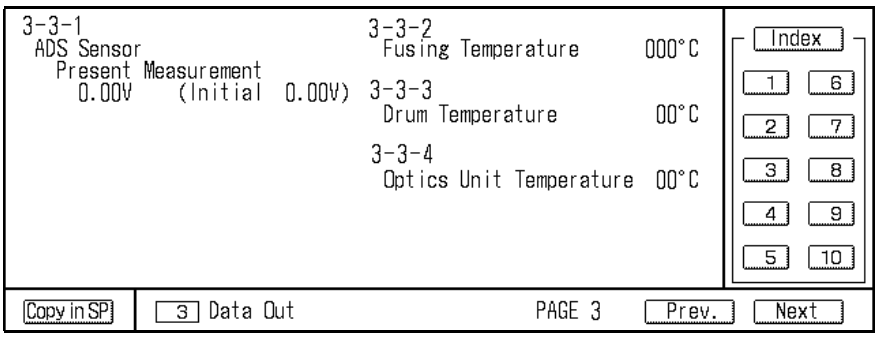


A246M522.PCX

SP No.	Function	Note
3-2-1-1	Indicates the current TD sensor output voltage.	**Standard**: 0.9 ~ 4.0 V
3-2-1-2	Indicates the last TD sensor output voltage during ID sensor compensation. (Previous: voltage at previous detected voltage during ID sensor compensation.)	**Standard**: 0.9 ~ 4.0 V
3-2-1-3	Indicates the toner supply level target voltage	**Standard**: 1.0 ~ 4.0 V
3-2-1-4	Indicates the TD sensor output voltage during the developer initialization.	**Standard**: 7.0 ~ 10.7 V
3-2-2-1	Indicates the ID sensor output voltage while detecting the bare drum surface (with development bias and development roller rotation.)	**Abnormal condition:** V_{SGP} < 2.5 V
3-2-2-2	Indicates the ID sensor output voltage while detecting the ID sensor pattern image.	**Abnormal condition:** V_{SP} > 2.5 V
3-2-2-3	Indicates the ID sensor output voltage while detecting the bare drum surface (without development bias and without development roller rotation.)	**Abnormal condition:** V_{SG} < 2.5 V
3-2-3	Indicates the drum potential while detecting the ID sensor pattern (grid voltage = –800 V).	**Standard**: 700 ~ 800 V
3-2-4	Indicates the current toner supply mode.	**A:** Auto Mode **T:** Detected Mode (Drum potential sensor or ID sensor abnormal) **C:** Fixed Mode (TD sensor abnormal, constant mode)
3-2-5	Indicates the toner supply level by image area ratio on the original surface. This value changes every copy through fuzzy control.	**Standard**: 0 ~ 60 %
3-2-6	Indicates the transfer voltage detected in the process control data initialization.	**L:** 0 ~ 3.3 kV **M:** 3.3 ~ 5.6 kV **H:** 5.6 kV ~

3 DATA OUT

PAGE 3

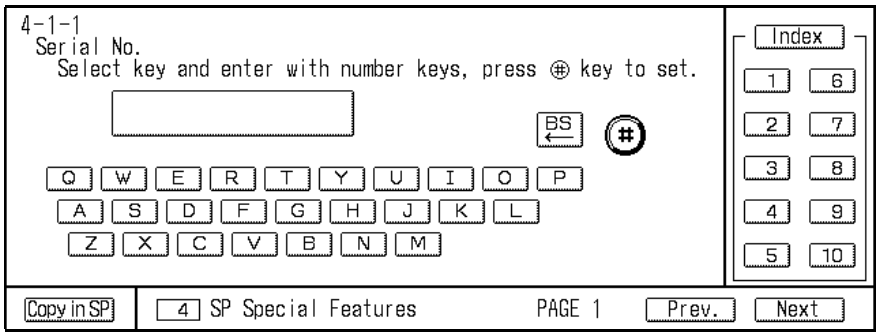


A246M523.PCX

SP No.	Function	Note
3-3-1	Indicates the ADS sensor outputs at every scan.	**Standard**: 2.7 ± 0.1 V Present: Output at last detection Initial: Output at ADS sensor initial setting.
3-3-2	Indicates the fusing temperature based on the fusing thermistor output.	**Standard**: Around 185°C
3-3-3	Indicates the drum temperature based on the drum thermistor output.	**Standard**: Less than 50°C
3-3-4	Indicates the optics temperature based on the optics thermistor output.	

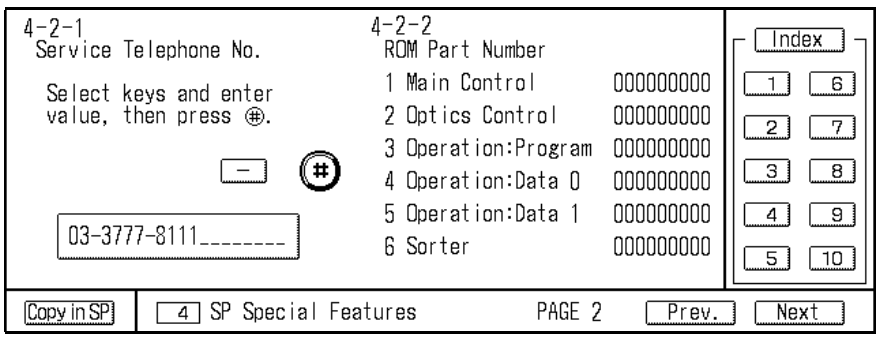
4 SP SPECIAL FEATURES

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A246M524.PCX

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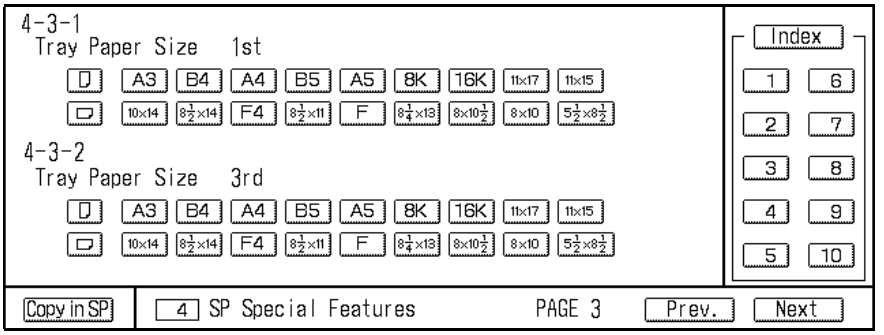


A246M525.PCX

SP No.	Function	Note
4-1-1	Holds the copier serial number.	**Procedure:** 1. Touch the "Serial Number Indicator" key. 2. Enter the serial number. Alphabet: Use LCD. Number: Use number keys. **Correction: Use "BS" key.** 3. Touch "#" to register.
4-2-1	Holds the service center telephone number. This telephone number is indicated on the LCD with the SC number when problem occurred.	**Procedure:** 1. Touch the "Telephone Number Indicator" key. 2. Enter the telephone number by pressing the number keys. 3. Use "–" key to enter a hyphen. 4. Touch "#" to register.
4-2-2	Indicates the part number with ROM suffixes on each PCB. 1. Main Control Board 2. Optics Control Board 3. Operation Panel: Program 4. Operation Panel: Data 0 5. Operation Panel: Data 1 6. Sorter	

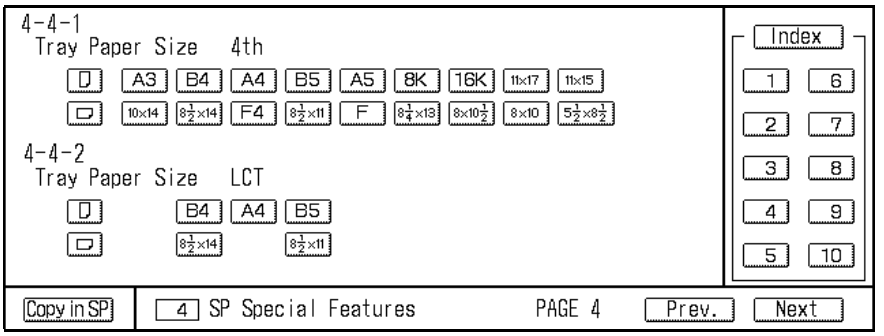
4 SP SPECIAL FEATURES

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A246M526.PCX

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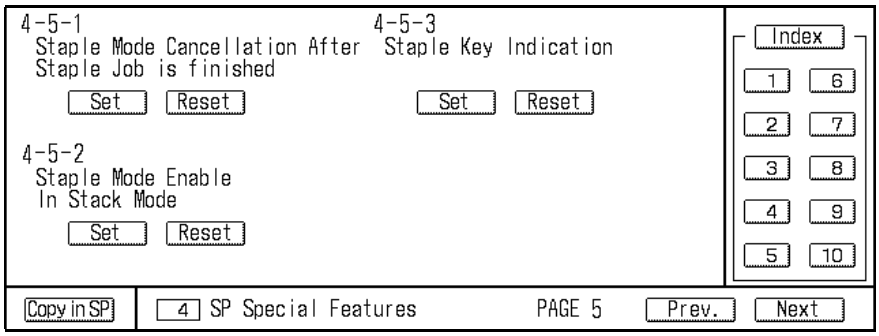


A246M527.PCX

SP No.	Function	Note
4-3-1	Selects the paper size for 1st tray.	**Factory setting:** A4/8 1/2 x 11 sideways
4-3-2	Selects the paper size for 3rd tray.	**Factory setting:** A3/11 x 17 lengthwise
4-4-1	Selects the paper size for 4th tray.	Japanese version only: Do not change the setting.
4-4-2	Selects the paper size for LCT.	**Factory setting:** A4/8 1/2 x 11 sideways

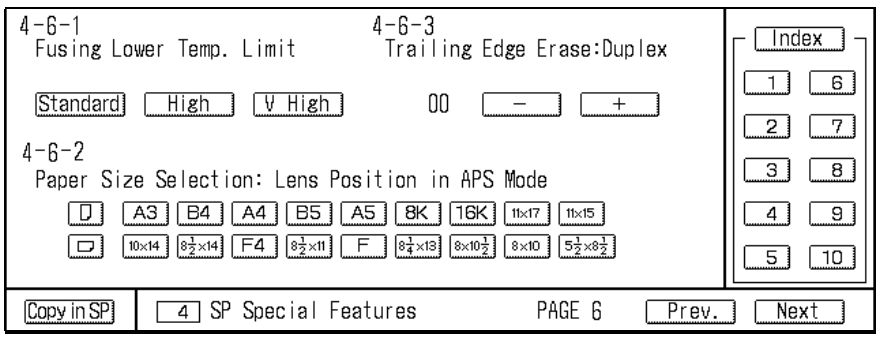
4 SP SPECIAL FEATURES

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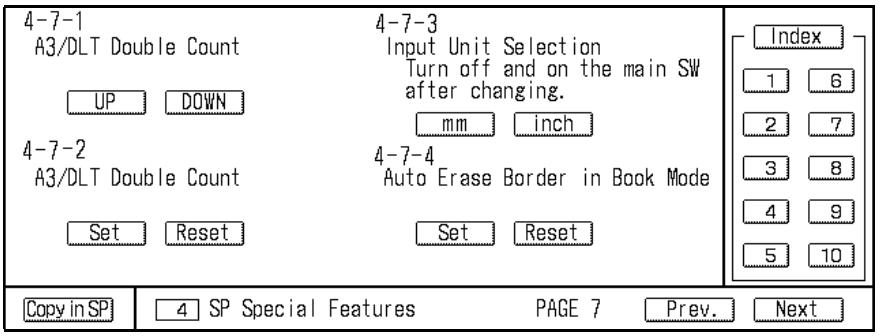


A246M529.PCX

SP No.	Function	Note
4-5-1	Clears the staple mode after staple job is finished. **Default:** Reset	
4-5-2	Allows the staple in stack mode. **Default:** Reset	
4-5-3	Effects the staple function. **Default:** Set	If set to “Reset”, the staple key is not displayed on the LCD
4-6-1	Selects the fusing lower temperature limit. During the copy run, when the fusing temperature drops to certain temperature, the copy speed will reduce to keep the good fusing condition. **Default:** Standard	If the customer complain of poor fusing of copies, change the setting. **Standard:** No CPM down **High:** 40 CPM at less than 150°C **V High:** 40 CPM at less than 170°C
4-6-2	Selects the lens waiting position in APS mode. **Default:** A4/8$\frac{1}{2}$ x 11 sideways	If selects the size which frequently used at the customer, 1st copy speed will be faster.
4-6-3	Adjusts the trailing edge erase on 1st side of duplex copies. **Default:** 0 mm (1 mm/step)	To prevent the paper from being sticking around the pressure roller when making the 2nd side of duplex copies.

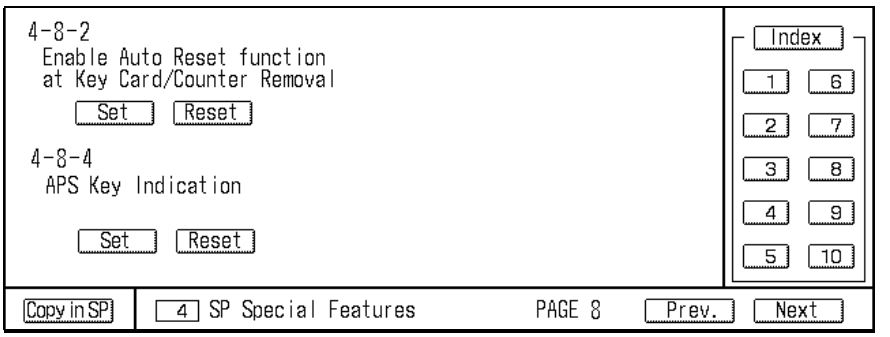
4 SP SPECIAL FEATURES

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A246M530.PCX

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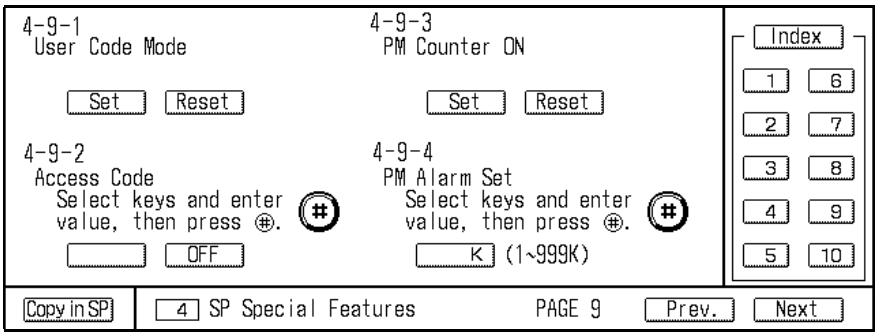


A246M531.PCX

SP No.	Function	Note
4-7-1	Selects copy count up or down. **Default:** Up	
4-7-2	Counts the total counter twice when and A3/11 x 17 copy is made. **Default:** Reset	
4-7-3	Selects what unit of paper size is used. **Default:** US version : inch Other version: mm	After changing the unit, turn the main switch off and on.
4-7-4	Enables the automatic access to the border/center erase mode in platen cover mode. **Default:** Reset	
4-8-2	Resets the copy mode to default when pulling out the key counter. **Default:** Set	
4-8-4	Deletes the APS indicator from the LCD. **Default:** Reset	

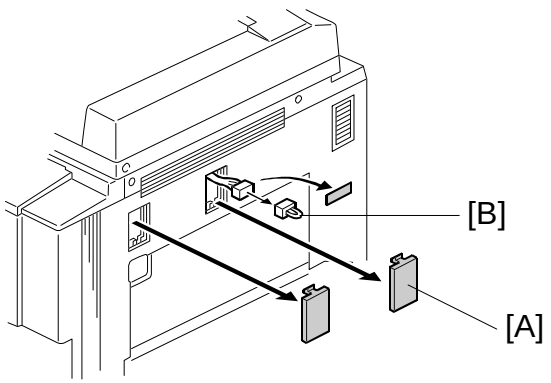
4 SP SPECIAL FEATURES

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A246M532.PCX

SP No.	Function	Note
4-9-1	Enables the user code mode. **Default:** Reset	To enable this SP below procedures are required.
4-9-2	Limits user access to User Tool No.9. (Set the key-operator code.)	**Procedure:** 1. Touch the "[ ]" key. 2. Input the access with the number keys. 3. Touch the "#" key.
4-9-3	Enables the PM counter alarm. **Default:** Reset	
4-9-4	Selects the PM alarm interval. **Default:** 150K	This interval is effective when SP 4-9-3 is selected to "Set".

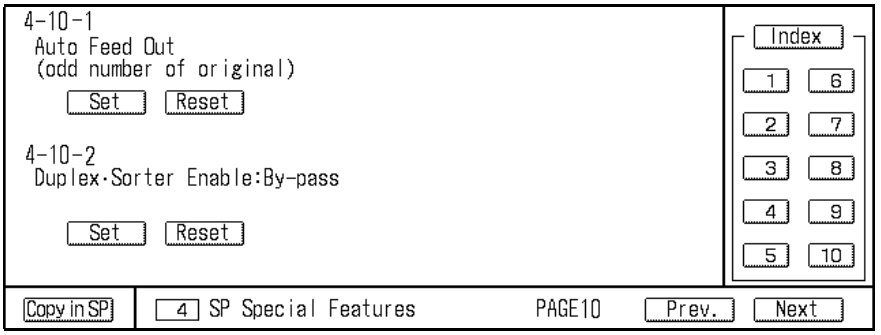


A246M564.WMF

1. Register at least one user code by using user tool No.9.
2. Touch "Set" key in this SP.
3. Turn off the main switch.
4. Remove the plastic cap [A] on the right cover and disconnect the key counter short-connector [B].
5. Reinstall plastic cap.
6. Turn on the main switch.

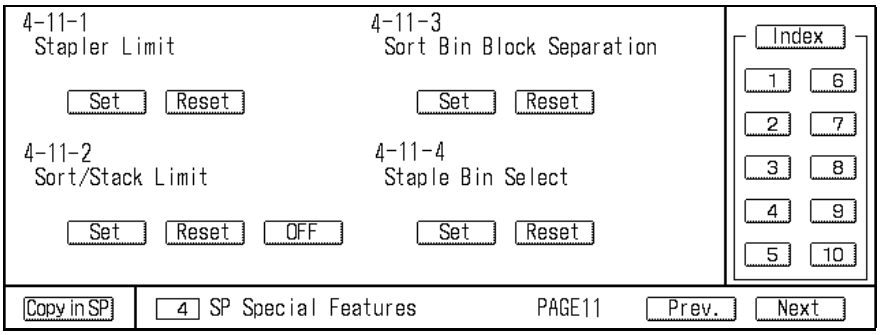
4 SP SPECIAL FEATURES

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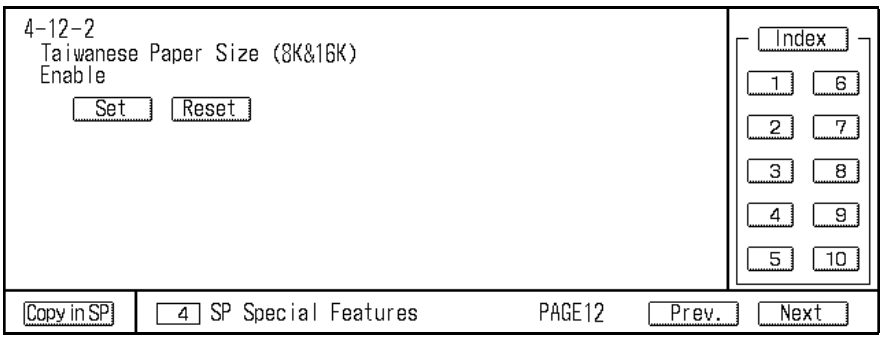


A246M534.PCX

SP No.	Function	Note
4-10-1	Enables automatic feed-out of last copy on the duplex tray without copying when an odd number of originals is set on the DF feed tray. **Default:** Reset	
4-10-2	Enables the duplex and sorter function from the by-pass tray. **Default:** Reset	The following mode is available: • One-sided original to duplex copy • Two sided original to duplex copy • Sort, Stack, Staple, Punch Skew problem may occur in duplex mode.
4-11-1	Changes the maximum copy quantity limit in staple mode. **Default:** Reset	Set: 40 Reset: 50
4-11-2	Changes the maximum copy quantity limit in sort and stack mode. **Default:** Reset	Set: 40 Reset: 50 OFF: 60
4-11-3	Enables the separation of two different sort and stack jobs into two different blocks of the bins. **Default:** Set	1st block: 1st to 10th bins 2nd block: 12th to 20th bins If a job selected requires 11 bins or more, 1st to 20th bins are used for the 1st block.
4-11-4	Selects the staple mode for the 1st job when the staple mode is selected for the 2nd job in the pre-set mode. **Default:** Reset	

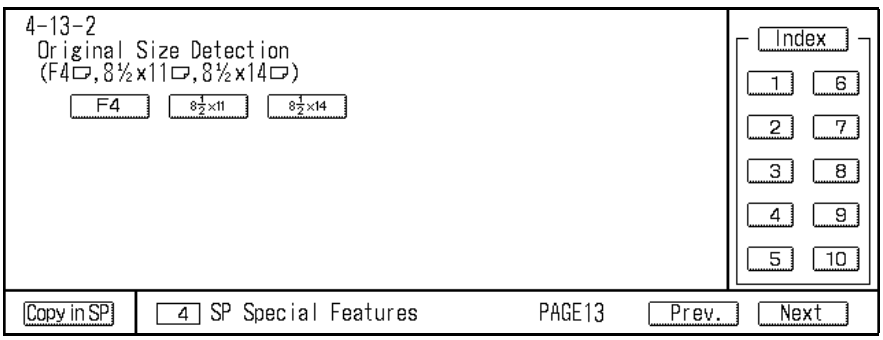
4 SP SPECIAL FEATURES

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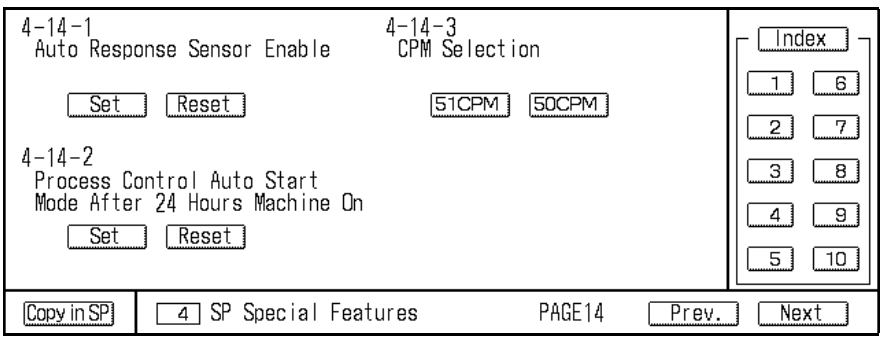
A246M535.PCX

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A246M536.PCX

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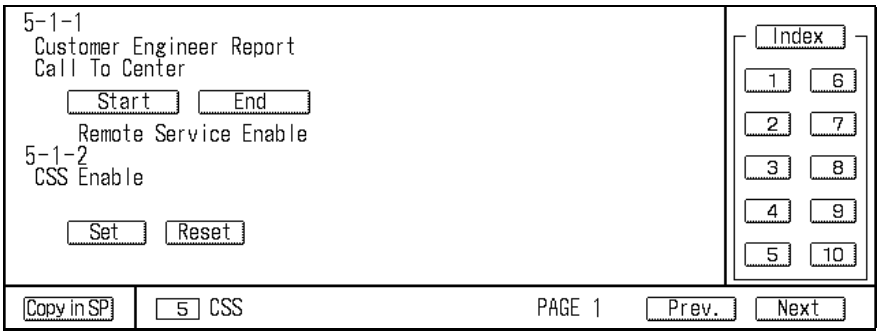


A246M537.PCX

SP No.	Function	Note
4-12-2	Enables the detection of Taiwanese paper size by APS. **Default:** Reset	
4-13-2	Selects the original when F4 size is detected by APS. **Default:** F4	
4-14-1	Enables the auto response sensor. **Default:** Set	
4-14-2	Enables to start the auto process control 24 hours after last auto process control. **Default:** Set	
4-14-4	Selects the machine version (50 CPM) in France. **Default:** 51CPM	

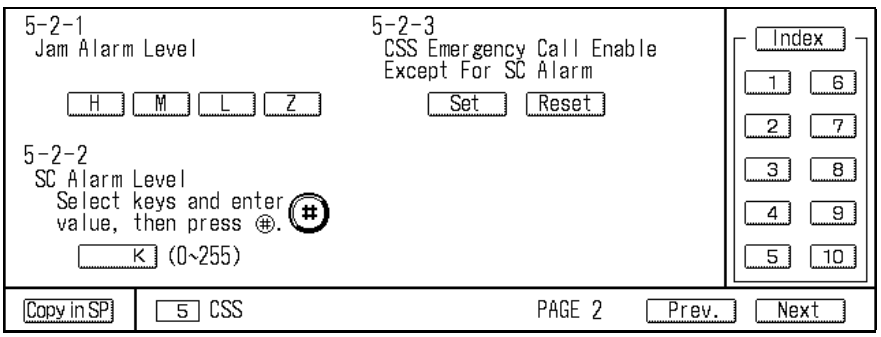
5 CSS

PAGE 1



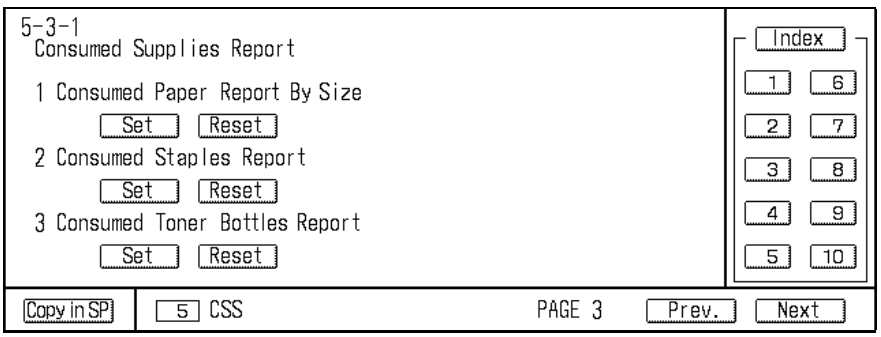
A246M538.PCX

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A246M539.PCX

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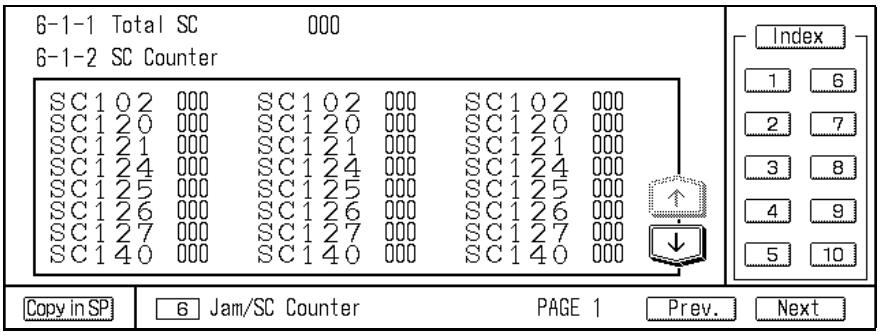


A246M540.PCX

SP No.	Function	Note
5-1-1	Japanese version only.	
5-1-2	Japanese version only.	
5-2-1	Japanese version only.	
5-2-2	Japanese version only.	
5-2-3	Japanese version only.	
5-3-1-1	Japanese version only.	
5-3-1-2	Japanese version only.	
5-3-1-3	Japanese version only.	

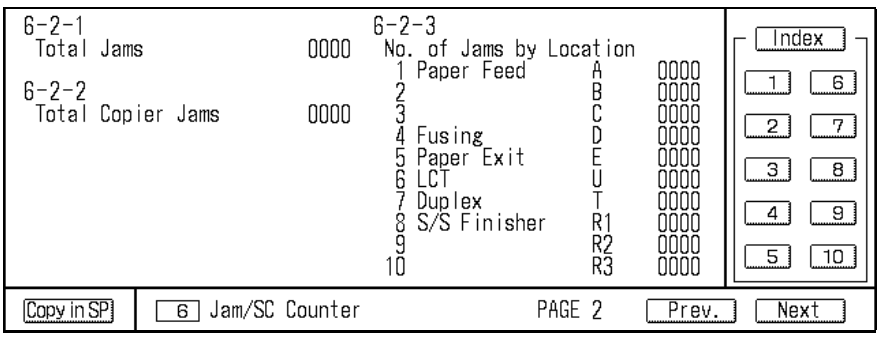
6 JAM/SC COUNTER

PAGE 1



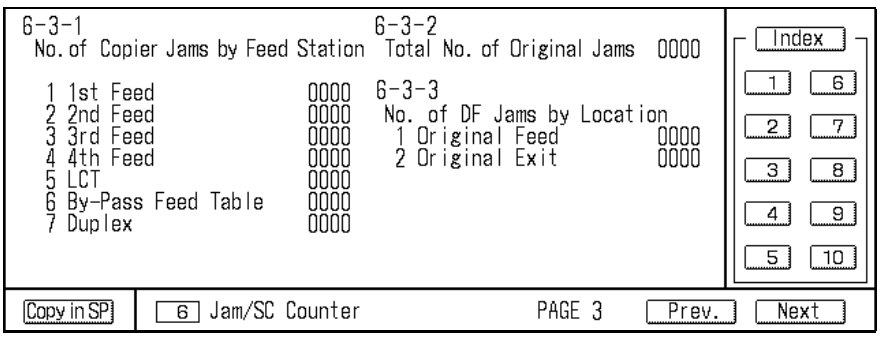
A246M541.PCX

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A246M542.PCX

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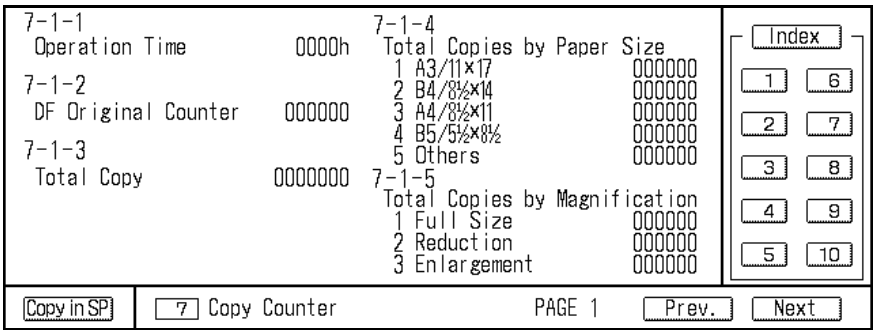


A246M543.PCX

SP No.	Function	Note
6-1-1	Indicates the total number of SCs.	
6-1-2	Indicates the total number of each SCs.	
6-2-1	Indicates the total number of jams in copier and all peripherals.	
6-2-2	Indicates the total number of jams in copier.	
6-2-3	Indicates the total number of jams by locations.	
6-3-1	Indicates the total number of jams by feed stations.	
6-3-2	Indicates the total number of jams in the ADF.	
6-3-3	Indicates the total number of jams by locations in the ADF.	

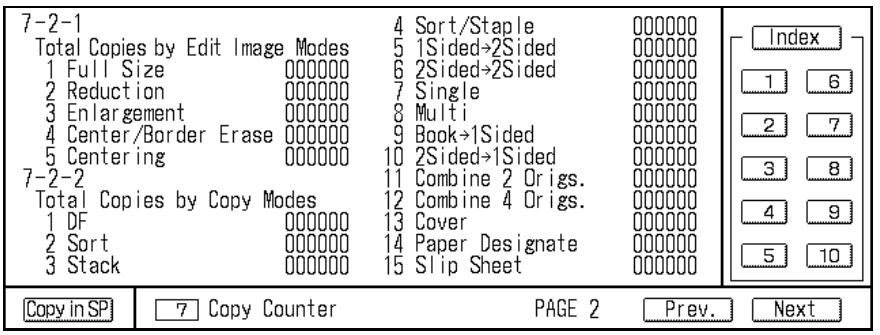
7 COPY COUNTER

PAGE 1



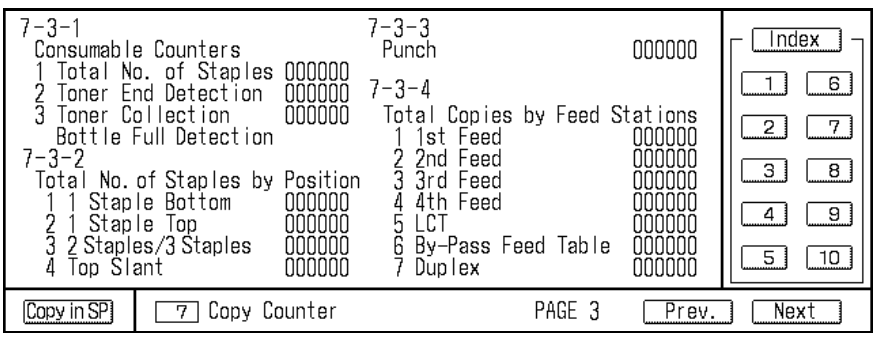
A246M544.PCX

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A246M545.PCX

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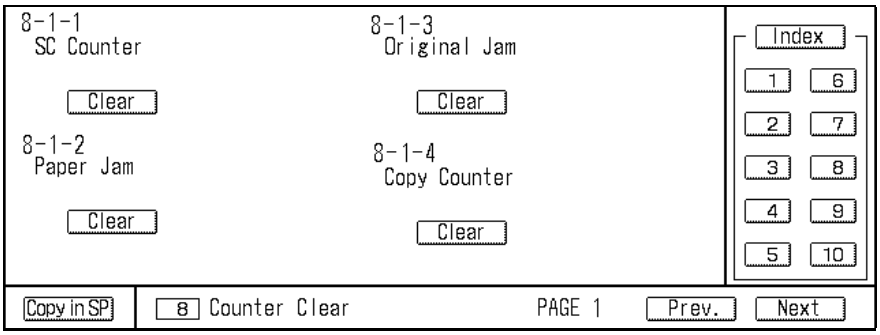


A246M546.PCX

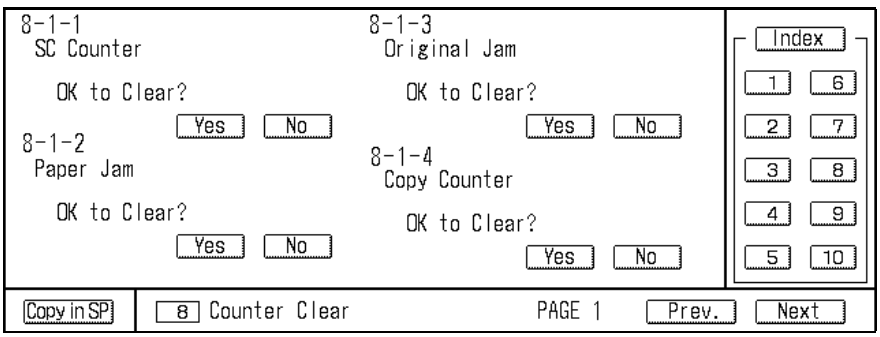
SP No.	Function	Note
7-1-1	Indicates the main motor rotation time.	
7-1-2	Indicates the total number of original fed by the ADF.	
7-1-3	Indicates the total number of copies.	
7-1-4	Indicates the total number of copies by paper size.	
7-1-5	Indicates the total number of copies by magnification.	
7-2-1	Indicates the total number of copies by edit image mode.	
7-2-2	Indicates the total number of copies by copy mode.	
7-3-1	Indicates the total number related consumables.	
7-3-2	Indicates the total number of staples by staple positions.	
7-3-3	Indicates the total number of punches.	
7-3-4	Indicates the total number of copies by feed stations.	

8 COUNTER CLEAR

PAGE 1



A246M547.PCX

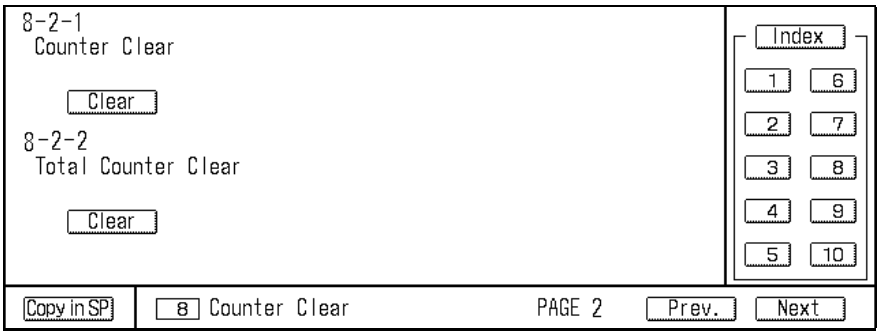


A246M548.PCX

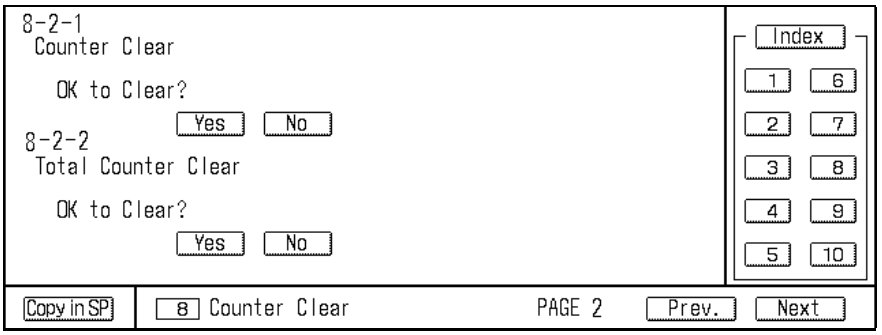
SP No.	Function	Note
8-1-1	Clear all SC counter. (SP6-1-1, SP6-1-2)	Procedure to clear: 1. Touch “Clear”. The display changes as shown in lower illustration. 2. Touch “Yes”. (Touch “No” to cancel.) The display returns to the upper illustration and the beeper sounds four times.
8-1-2	Clear all paper jam counter. (SP6-2-1, SP6-2-2, SP6-2-3, SP6-3-1)	
8-1-3	Clear all original jam counter. (SP6-3-2, SP6-3-3)	
8-1-4	Clear all copy counter. (SP7-1-1, SP7-1-2, SP7-1-3, SP7-1-4, SP7-1-5, SP7-2-1, SP7-2-2, SP7-3-1, SP7-3-2, SP7-3-3, SP7-3-4)	

8 COUNTER CLEAR

PAGE 2



A246M549.PCX

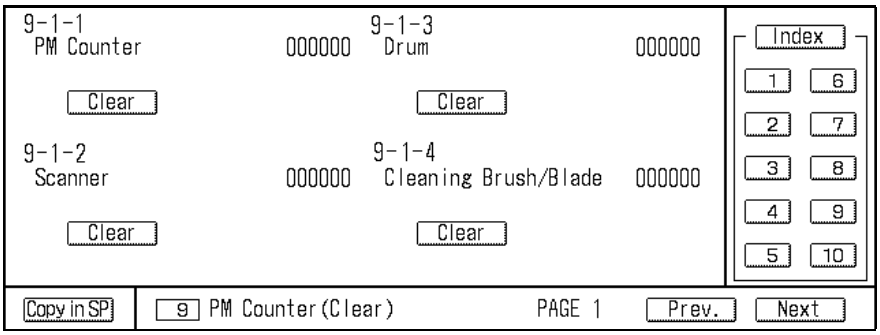


A246M550.PCX

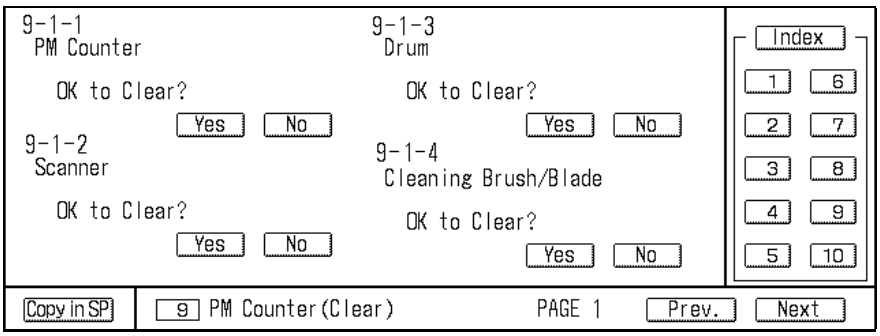
SP No.	Function	Note
8-2-1	Clear all counter except total copy counter.	Procedure to clear: 1. Touch “Clear”. The display changes as shown in lower illustration. 2. Touch “Yes”. (Touch “No” to cancel.) The display returns to the upper illustration and the beeper sounds four times. The total copy counter can be cleared when counter is minus (–).
8-2-2	Clear the total copy counter.	

9 PM COUNTER (CLEAR)

PAGE 1



A246M551.PCX

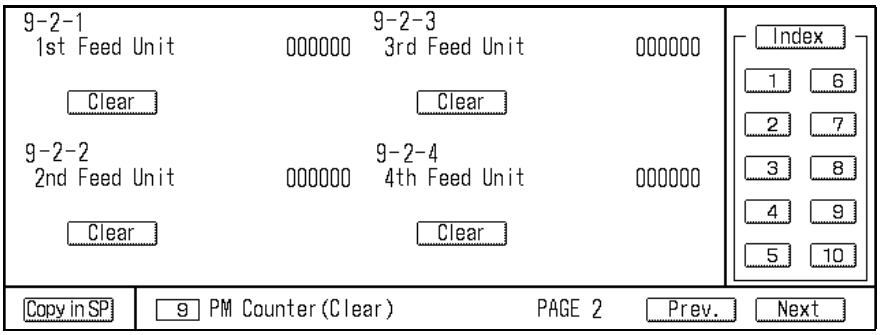


A246M552.PCX

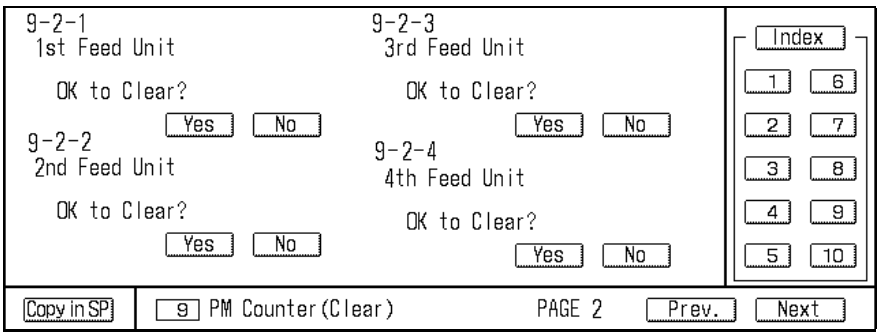
SP No.	Function	Note
9-1-1	1. Indicates the total number of copies since the last PM. 2. Clears the PM counter.	Procedure to clear: 1. Touch “Clear”. The display changes as shown in lower illustration. 2. Touch “Yes”. (Touch “No” to cancel.) The display returns to the upper illustration.
9-1-2	1. Indicates the total number of copies since the last PM for the scanner. 2. Clears the scanner counter.	
9-1-3	1. Indicates the total number of copies since the last PM for the drum. 2. Clears the drum counter.	
9-1-4	1. Indicates the total number of copies since the last PM for the cleaning blade and cleaning brush. 2. Clears the cleaning blade and cleaning brush counter.	

9 PM COUNTER (CLEAR)

PAGE 2



A246M553.PCX

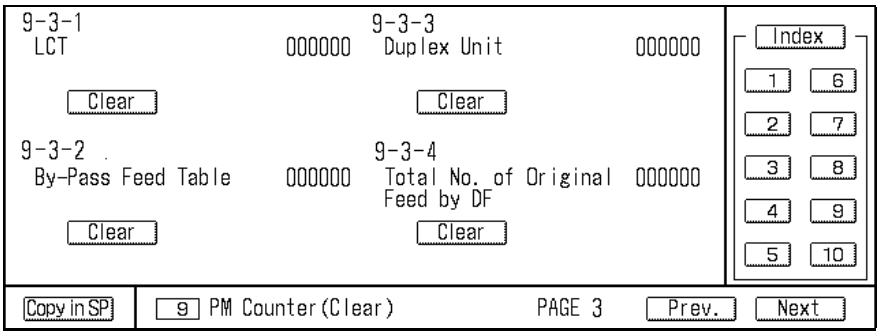


A246M554.PCX

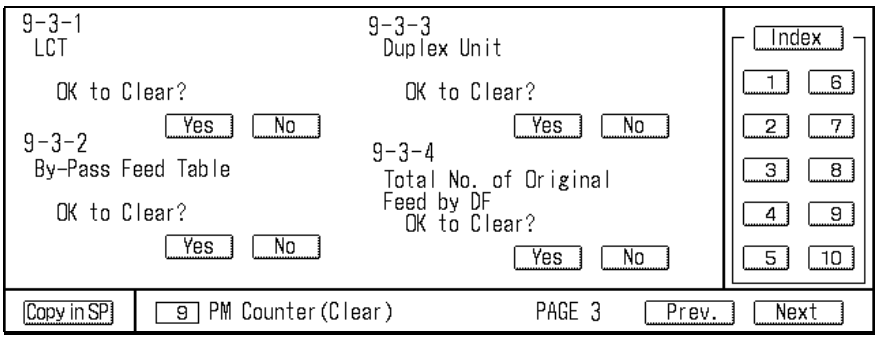
SP No.	Function	Note
9-2-1	1. Indicates the total number of copies feeding from the 1st feed unit since the last PM for it. 2. Clears the 1st feed unit counter.	Procedure to clear: 1. Touch “Clear”. The display changes as shown in lower illustration. 2. Touch “Yes”. (Touch “No” to cancel.) The display returns to the upper illustration.
9-2-2	1. Indicates the total number of copies feeding from the 2nd feed unit since the last PM for it. 2. Clears the 2nd feed unit counter.	
9-2-3	1. Indicates the total number of copies feeding from the 3rd feed unit since the last PM for it. 2. Clears the 3rd feed unit counter.	The 4th feed unit counter is for Japanese version only.
9-2-4	1. Indicates the total number of copies feeding from the 4th feed unit since the last PM for it. (Japanese version only) 2. Clears the 4th feed unit counter.	

9 PM COUNTER (CLEAR)

PAGE 3



A246M555.PCX

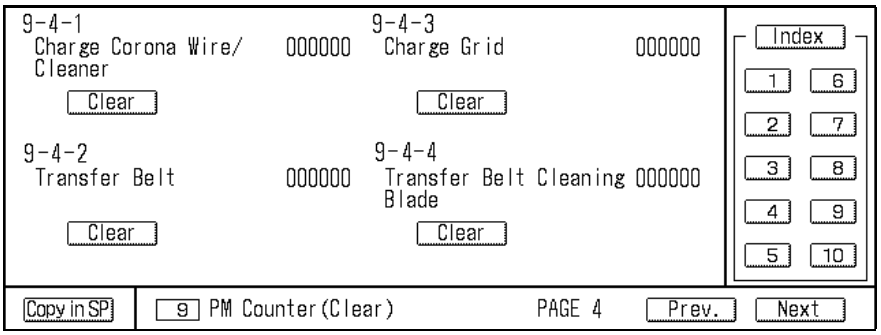


A246M556.PCX

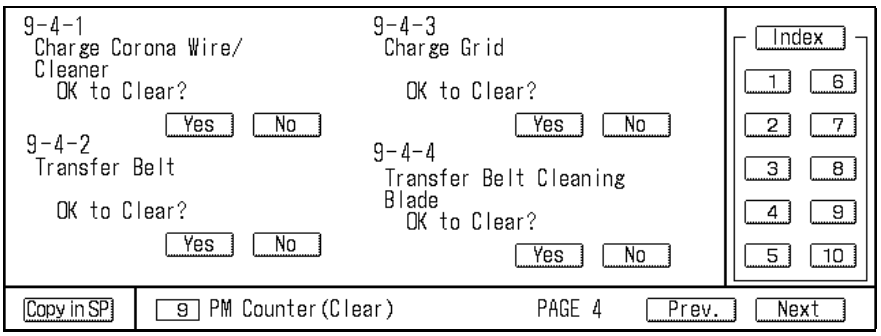
SP No.	Function	Note
9-3-1	1. Indicates the total number of copies feeding from the LCT since the last PM for it. 2. Clears the LCT counter.	Procedure to clear: 1. Touch “Clear”. The display changes as shown in lower illustration. 2. Touch “Yes”. (Touch “No” to cancel.) The display returns to the upper illustration.
9-3-2	1. Indicates the total number of copies feeding from the by-pass tray since the last PM for it. 2. Clears the by-pass tray counter.	
9-3-3	1. Indicates the total number of copies feeding from the duplex tray since the last PM for it. 2. Clears the duplex tray counter.	
9-3-4	1. Indicates the total number of originals fed by the ADF since the last PM for it. 2. Clears the ADF counter.	

9 PM COUNTER (CLEAR)

PAGE 4



A246M557.PCX

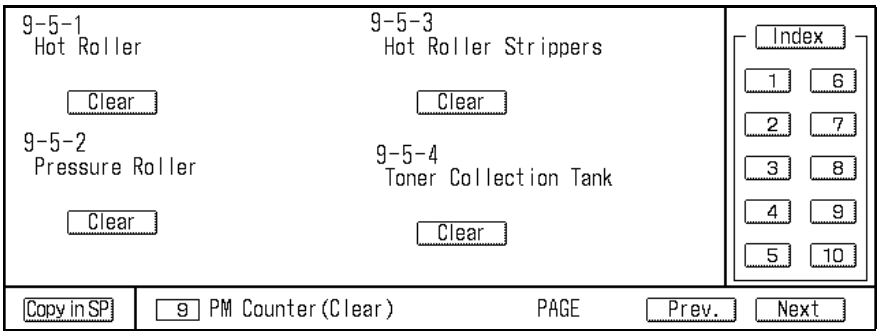


A246M558.PCX

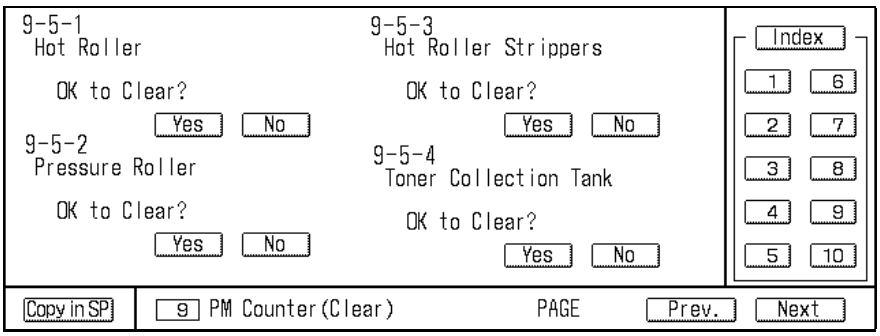
SP No.	Function	Note
9-4-1	1. Indicates the total number of copies since the last PM for the charge corona wire and cleaner. 2. Clears the charge corona wire and cleaner counter.	Procedure to clear: 1. Touch “Clear”. The display changes as shown in lower illustration. 2. Touch “Yes”. (Touch “No” to cancel.) The display returns to the upper.
9-4-2	1. Indicates the total number of copies since the last PM for the transfer belt. 2. Clears the transfer belt counter.	
9-4-3	1. Indicates the total number of copies since the last PM for the charge grid. 2. Clears the charge grid counter.	
9-4-4	1. Indicates the total number of copies since the last PM for the transfer belt cleaning blade. 2. Clears the transfer belt cleaning blade counter.	

9 PM COUNTER (CLEAR)

PAGE 5



A246M559.PCX

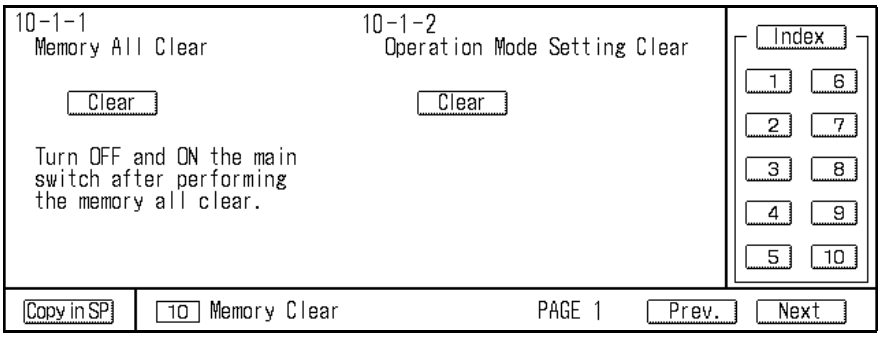


A246M560.PCX

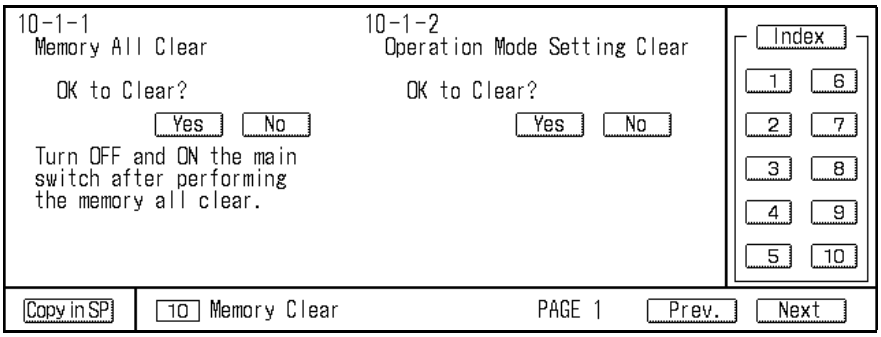
SP No.	Function	Note
9-5-1	1. Indicates the total number of copies since the last PM for the hot roller. 2. Clears the hot roller counter.	Procedure to clear: 1. Touch “Clear”. The display changes as shown in lower illustration. 2. Touch “Yes”. (Touch “No” to cancel.) The display returns to the upper illustration.
9-5-2	1. Indicates the total number of copies since the last PM for the pressure roller. 2. Clears the pressure roller counter.	
9-5-3	1. Indicates the total number of copies since the last PM for the hot roller strippers. 2. Clears the hot roller strippers counter.	
9-5-4	1. Indicates the total number of copies since the last PM for the toner collection tank. 2. Clears the toner collection tank counter.	

10 MEMORY CLEAR

PAGE 1



A246M561.PCX



A246M562.PCX

SP No.	Function	Note
10-1-1	Returns the all settings to the default settings.	Procedure to clear: 1. Open the front cover and touch “Clear”. The display changes as shown in lower illustration. 2. Touch “Yes”. (Touch “No” to cancel.) The display returns to the upper illustration and the beeper sounds two times. 3. Turn the main switch off and on. After clearing all memory, do the following: 1. Calibrate the touch screen. 2. Input the factory setting using data sheet coming with machine. 3. Replace the developer and do the developer initialization. 4. Perform the process control initial setting. 5. Adjust the copy image.
10-1-2	Clears the data related the operation.	The following data will be cleared. 1. UP mode (except user code, user counter and timer setting.) 2. SP 4 Special Features (except tray paper size, serial number, Service Telephone no.) 3. User Program

4.2.3 INPUT CHECK

1. Access SP2-4-1 (Input Check)
2. Enter the sensor/switch/signal number using following table.
3. Check the status using following table.

No.	Sensor/Switch/Signal	Start	
		0	1
1	Registration Sensor	No paper	Paper Detected
2	Fusing Exit Sensor	No paper	Paper Detected
3	Exit Sensor	No paper	Paper Detected
4	Vertical Transport Sensor	No paper	Paper Detected
5	Not Used	—	—
6	By-pass Paper End Sensor	Not paper end	Paper end
7	Rear Side Fence Open Sensor	Not detected	Detected
8	2nd Paper End Sensor	Not paper end	Paper end
9	3rd Paper End Sensor	Not paper end	Paper end
10	Rear Side Fence Close Sensor	Not detected	Detected
11	2nd Paper Near End Sensor	Not near end	Near end
12	3rd Paper Near End Sensor	Not near end	Near end
13	2nd Paper Size Switch (All SW)	Not detected	Detected
14	2nd Tray Set Detection	Not Set	Set
15	Not used	—	—
16	3rd Tray Set Detection	Not Set	Set
17	1st Paper Feed Sensor	No paper	Paper Detected
18	Not Used	—	—
19	2nd Paper Feed Sensor	No paper	Paper Detected
20	3rd Paper Feed Sensor	No paper	Paper Detected
21	Not Used	—	—
22	2nd Lift Sensor	Detect	Not detect
23	3rd Lift Sensor	Detect	Not detect
24	Fusing Unit Set Detection	Not Set	Set
25	Not Used	—	—
26	1st Paper End Sensor	Not paper end	Paper end
27	Left Tray Paper Sensor	Paper detected	No paper
28	Right Tandem Tray Set Detection	Not Set	Set
29	Left Tandem Tray Set Detection	Not Set	Set
30	Rear Fence Return Sensor	Not detected	Detected
31	Rear Fence HP Sensor	Not detected	Detected
32	Right Tray Down Sensor	Not detected	Detected
33	1st Paper Near End	Not near end	Near end
34	1st Lift Sensor	Detect	Not detect
35	Front Side Fence Close Sensor	Detect	Not detect
36	Paper End Sensor - LCT	Not paper end	Paper end
37	LCT Set Detection	Not Set	Set
38	Lift Sensor - LCT	Not detected	Detected
39	Tray Down Switch - LCT	Not pressed	Pressed

No.	Sensor/Switch/Signal	Start	
		0	1
40	Paper Feed Sensor - LCT	No paper	Paper detected
41	Tray Down Sensor - LCT	Not detected	Detected
42	Cover Switches - LCT	Closed	Opened
43	Paper Position Sensor - LCT	Not detected	Detected
44	Duplex Jogger HP Sensor	Not detected	Detected
45	Duplex Entrance Sensor	No paper	Paper detected
46	Duplex Transport Sensor	No paper	Paper detected
47	Duplex Exit Sensor	No paper	Paper detected
48	Duplex Unit Set Detection	Not set	Set
49	Duplex Paper End Sensor	Not paper end	Paper end
50	Toner End Sensor	Toner end	Not toner end
51	Toner Overflow Sensor	Not detected	Detected
52	By-pass Table Switch	Close	Open
53	Front Door Safety Switch	Close	Open
54	Toner Collection Bottle Set Switch	Not set	Set
55	By-pass Feed Motor Lock Detection	Normal	Overload
56	Development Motor Lock Detection	Normal	Overload
57	Main Motor Lock Detection	Normal	Overload
58	Toner Collection Motor Lock Detection	Normal	Overload
59	Paper Feed Motor Lock Detection	Normal	Overload
60	Fusing/Duplex Motor Lock Detection	Normal	Overload
61	Not used	—	—
62	Paper Guide Sensor	No Paper	Paper detected
63	1st Tray Detection (Tandem LCT)	Not installed	Installed
64	1st Tray Detection (Tandem)	Not installed	Installed
65	Paper Near End Sensor - LCT	Not near end	Near End
66	Guide Plate Position Sensor	Closed	Open
67	Feed Motor Lock - LCT	Normal	Overload
68	Front Side Fence Open Sensor	Detected	Not detected
69	Right Tray Paper Sensor	Paper detected	No paper
69 ~ 90	Not Used	—	—
91	Auto Response Sensor	Not detected	Detected
92	Key Counter Set Detection	Not set	Set
93 ~ 99	Not Used	—	—
101	Entrance Sensor - S/S (A821)	Paper detected	No paper
102	Proof Exit Sensor - S/S (A821)	Paper detected	No paper
103	Bin Jam Sensor - S/S (A821,A658)	Paper detected	No paper
104	Paper Sensor - S/S (A821,A658)	Paper detected	No paper
105	Bin HP Sensor - S/S (A821,A658)	Not detected	Detected
106	Wheel Sensor - S/S (A821,A658)	Pulse	Pulse
107	Bin Rear Plate Open Sensor - S/S (A821)	Detected	Not detected
108	Bin Rear Plate Close Sensor - S/S (A821)	Not detected	Detected
109	Jogger HP Sensor - S/S (A821,A658)	Detected	Not detected
110	Grip HP Sensor - S/S (A821,A658)	Not detected	Detected
111	Stapler Unit HP Sensor - S/S (A821)	Not detected	Detected

No.	Sensor/Switch/Signal	Start	
		0	1
112	Stapler HP sensor - S/S (A821,A658)	Detected	Not Detected
113	Staple End Switch - S/S (A821,A658)	Not staple end	Staple end
114	Paper Sensor - S/S (A821,A658)	Not detect	Detected
115	Door Safety Switch - S/S (A821,A658)	Closed	Open
116	Transport Motor Encoder - S/S (A821,A658)	Pulse	Pulse
117	Punch Unit Set Detection - S/S (A821)	Set	Not set
118	Punch HP Sensor - S/S (A821)	Not detected	Detected
119	Punch Waste Over Flow Sensor - S/S (A821)	Not detected	Detected
120	Cartridge Set Switch - S/S (A821)	Set	Not set
121	Staple Unit Set Detection - S/S (A821)	Set	Not set
122	Staple Unit Pull-out Position Sensor - S/S (A821)	Not detected	Detected
123	Grip Unit HP sensor - S/S (A821)	Not detected	Detected
124 ~ 130	Not Used	—	—
131	Scanner HP Sensor	Detected	Not detected
132	Lens Vertical HP Sensor	Not detected	Detected
133	Lens Horizontal HP Sensor	Not detected	Detected
134	3rd Scanner HP Sensor	Detected	Not detected
135	Platen Cover Position Sensor 1	Not detected	Detected
136	Platen Cover Position Sensor 2	Not detected	Detected
137 ~ 151	Not Used	—	—
152	Original Set Sensor - DJF	Not set	Set
153	Original Feed Sensor - DJF	Not detected	Detected
154	Not Used	—	—
155	DF Position Sensor - DJF	Detected	Not detected
156	Feed-out Motor Encoder - DJF	Pulse	Pulse
157	Transport Motor Encoder - DJF	Pulse	Pulse
158	Feed-in Motor Encoder - DJF	Pulse	Pulse
159	Registration Sensor 2 - DJF	Not detected	Detected
160	Original Width Sensor 1 - DJF	Not detected	Detected
161	Original Width Sensor 2 - DJF	Not detected	Detected
162	Original Width Sensor 3 - DJF	Not detected	Detected
163	Registration Sensor 1 - DJF	Not detected	Detected
164	Feed-out Sensor - DJF	Pulse	Pulse
165	Friction Belt Turn Sensor - DJF	Pulse	Pulse
166	APS Start Sensor - DJF	Not detected	Detected
167	Feed-in Cover Open Sensor - DJF	Close	Open
168	Not Used	—	—
169	Pulse Count Sensor - DJF	Pulse	Pulse

4.2.4 OUTPUT CHECK

1. Access SP 2-4-2 (Output Check)
2. Enter the electrical component number using following table.
3. Check the status using following table.

CAUTION: Do not turn on the toner supply clutch and development motor same time. Becomes too much toner in the development unit.
When turns the toner bottle motor, the toner is supplied. Be careful too much toner in the toner hopper.
The lift motor does not stop by the lift sensor when turned on them by this SP.

No.	Electrical Component
1	Not Used
2	Junction Gate Solenoid
3	Feed Clutch - LCT
4	By-pass Feed Clutch
5	Duplex Transport Clutch
6	Toner Supply Clutch
7	By-pass Pick-up Solenoid
8	Guide Plate Solenoid
9	Pick-up Solenoid - LCT
10	Toner Bottle Motor
11	Duplex Feed Clutch
12	Pressure Arm Solenoid
13	Duplex Positioning Solenoid
14	Down Switch LED - LCT
15	Not Used
16	Main Motor forward
17	Main Motor Reverse
18	Fusing/Duplex Motor
19	Development Motor
20	By-pass Feed Motor - Low Speed
21	By-pass Feed Motor - High Speed
22	LCT Motor - UP
23	LCT Motor - Down
24	Paper Feed Motor - Low Speed
25	Paper Feed Motor - High Speed (First copy from the 1st feed tray)
26	Anti-condensation Heater Relay
27	1st Pick-up Solenoid
28	Front Side Fence Solenoid
29	2nd Pick-up Solenoid
30	3rd Pick-up Solenoid
31	1st Separation Solenoid
32	Rear Side Fence Solenoid
33	2nd Separation Solenoid

No.	Electrical Component
34	3rd Separation Solenoid
35	Not Used
36	Not Used
37	Right Tandem Lock Solenoid
38	1st Lift Motor - UP
39	1st Lift Motor - Down
40, 41	Not Used
42	2nd Lift Motor - UP
43	2nd Lift Motor - Down
44	3rd Lift Motor - UP
45	3rd Lift Motor - Down
46	Rear Fence Motor - Forward
47	Rear Fence Motor - Down
48	1st Feed Clutch
49	Left Tandem Lock Solenoid
50	2nd Feed Clutch
51	3rd Feed Clutch
52	Registration Motor
53	Toner Recycle Motor
54	Erase Lamp
55	Corona Wire Cleaner Motor
56	Transfer Belt Positioning Solenoid
57	Potential Calibration Mode (–100V)
58	Potential Calibration Mode (–800V)
59	QL/PTL
60	Charge Corona/Grid (Copying)
61	Charge Corona/Grid (ID Sensor Pattern)
62	Development Bias (Copying)
63	Development Bias (Non-image Area)
64	Development Bias (ID Sensor Pattern)
65	Transfer Current
66	Exhaust Fan - Low Speed
67	Exhaust Fan - High Speed
68	Toner Collection Motor
69	Toner Recycle Clutch
70	Optics Board Cooling Fan - High Speed
71	Optics Board Cooling Fan - Low Speed
72	Duplex Cooling Fan
73	Not Used
74	Drum Cooling Fan - High Speed
75	Drum Cooling Fan - Low Speed
76	LCT Feed Motor - High Speed
77	LCT Feed Motor - Low Speed
78	Drum Grounding Relay OFF (Float)
79	Not Used

No.	Electrical Component
80	Main Switch OFF Solenoid
81 ~ 100	Not Used
101	Transport Motor - Proof Mode - S/S
102	Transport Motor - Sort Mode - S/S
103	Exit Motor - S/S
104	Turn Gate Solenoid - S/S
105	Bin Motor - S/S
106	Jogger Motor - S/S
107	Bin Rear Plate Motor - S/S
108	Grip Motor - S/S
109	Grip Unit Motor - S/S
110	Not Used
111	Stapler Unit Motor
112	Stapler Motor - S/S
113	Punch Motor - S/S
114 ~ 130	Not Used
131	Optics Cooling Fan
132 ~ 153	Not Used
154	“REDAY” LED - DJF
155	“AUTO” LED - DJF
156	Not Used
157	Feed-in Motor - DJF
158	Feed-out Motor - DJF
159	Not Used
160	Belt Drive Motor - DJF
161	Not Used
162	Friction Belt Motor - DJF
163, 164	Not Used
165	Feed-in Clutch - DJF
166	Inverter Solenoid - DJF
167	Stopper Solenoid - DJF

4.3 USER PROGRAM

The user program (UP) mode is accessed by users, and by sales and service staff. UP mode is used to input the copier's default setting.

4.3.1 HOW TO ENTER AND EXIT UP MODE

Press the User Tool/Total Count button, then selects the UP mode program. After finishing the UP mode program, touch "Exit" key to exit UP mode.

4.3.2 UP MODE TABLE

NOTE: The function of each user tool is explained in the operating instructions.

Item 1	Page	Item 2
1 Set Operation Modes		
	1/2	Screen Saver
		Default Setting
	2/2	Touch Panel in Waiting Mode
		Panel Beeper
		Job End Call
2 Auto Reset/Auto Off		
	1/2	Auto reset
		Low Power Timer
		Auto off
		User Code Mode Set
		SADF Auto rest
	2/2	AOF(keep it on)
3 Basic Function Setting		
	1/1	Auto Paper Select Priority
		Auto Paper Select
		Paper Tray Display in APS Mode
4 Reproduction Ratio Priority Setting		
	1/2	Reduce
		Enlarge
		Preset R/E key display
	2/2	Create Margin ratio setting
5 Select Special Tray		
	1/2	Tray for Cover Sheet
		Tray for Slip Sheet
	2/2	Tray for recycled Paper
		Tray for Special Paper

Item 1	Page	Item 2
6 Versatile Features Setting		
	1/2	Display Key Setting
		Priority Setting
	2/2	Priority Setting in duplex mode
		Default Setting for erase center width
		Margin Auto Shift (Single – Duplex)
		Default Setting for erase border width
7 Image Reproduction Setting		
	1/1	Image Density Level
		3 side Full Image
8 Tray Setting		
	1/1	Paper Tray Priority
		Auto Tray Switching
9 Management Setting		
	1/1	9-1 Set User Code
		9-2 Check/Reset copy count
		9-3 Reset Data for user Codes
		9-4 Reset User Code Counters
10 Peripherals attachment Setting		
	1/1	Priority setting in Special Original Mode
		Change Staple Numbers
		Auto sort
11 Set date/time		
	1/1	Set date/time
12 Weekly Timer		
	1/1	Auto power ON/OFF

4.4 TEST POINTS/DIP SWITCHES/LEDS

4.4.1 DIP SWITCHES

Main Board

SW102				Description
4	3	2	1	
0	0	0	0	Normal operating mode
0	0	0	1	Not Used
0	0	1	0	Forced Ready Condition (Factory use). Do not use in the field.
Others				Not Used

Optics Control Board

SW101				Description
4	3	2	1	
0	0	0	0	Normal operating mode
0	0	0	1	Not Used
0	0	1	0	APS size detection is canceled in the low power mode (Note1).
0	0	1	1	Not Used
0	1	0	0	Not Used
0	1	0	1	Not Used
1	1	0	0	Scanner Free Run by short circuiting TP516 and TP510
Others				Not Used

1: ON 0: OFF

Note1: The rotation of the motor can be stopped in the low power mode. In this case, 2 seconds are required to stabilize the motor rotation after canceling the low power mode. Note that within 2 seconds, the correct original size may not be detected.

4.4.2 TEST POINTS

Optics Control Board

Part Number	Monitored Signal
TP507	+5V
TP510	Ground
TP516	Free Run

4.4.3 FUSES

PSU

Number	Description
FU801	Protects the ac input line.
FU802	Protects +24V
FU803	Protects +24V
FU804	Protects +24V
FU805	Protects +24V

4.4.4 LEDS

Main

Number	Monitored Signal
LED101	Blinking: Normal, Not lit: No 5 V line on the Main Control PCB, lit: IC107 does not work.

4.5 SPECIAL TOOLS AND LUBRICANTS

4.5.1 SPECIAL TOOLS

Part Number	Description	Q'ty
A0961337	Scanner Positioning Pin	2
54209516	Test Chart - OS-A3 (10 pcs/Set)	1
A0299387	Digital Multimeter - FLUKE 87	1

4.5.2 LUBRICANTS

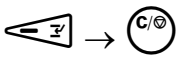
Part Number	Description	Q'ty
A0289300	Grease Barrierta JFE 55/2	1
52039502	Silicone Grease G-501	1
G0049668	Grease: KS660: SHIN ETSU	1

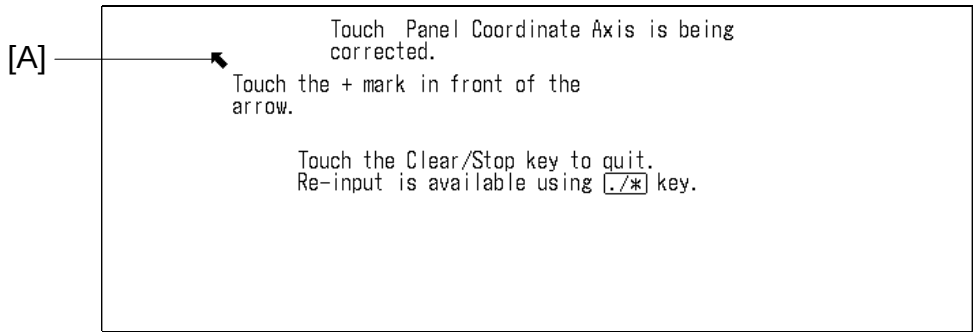
4.6 TOUCH PANEL DISPLAY POSITION ADJUSTMENT

Due to inaccurate display position adjustment, it is possible that the touch panel sometimes does not respond if the key is touched.

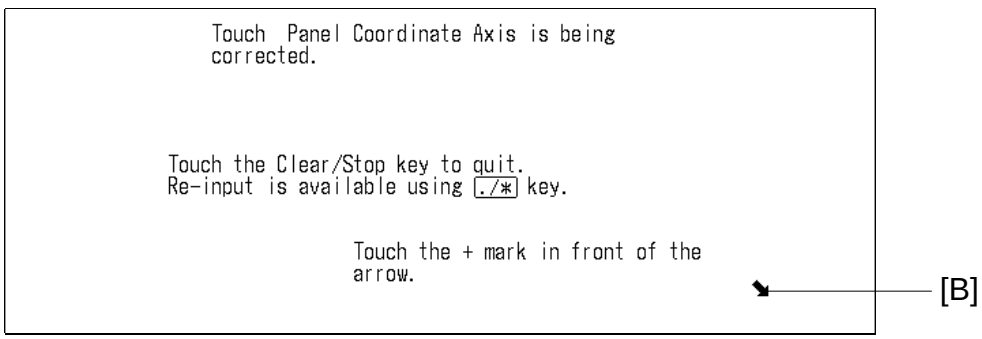
In this case, precisely adjust the touch panel display position as follows:

1. Press the “Interrupt” key then hold down the “Clear/Stop” key for more than three seconds.



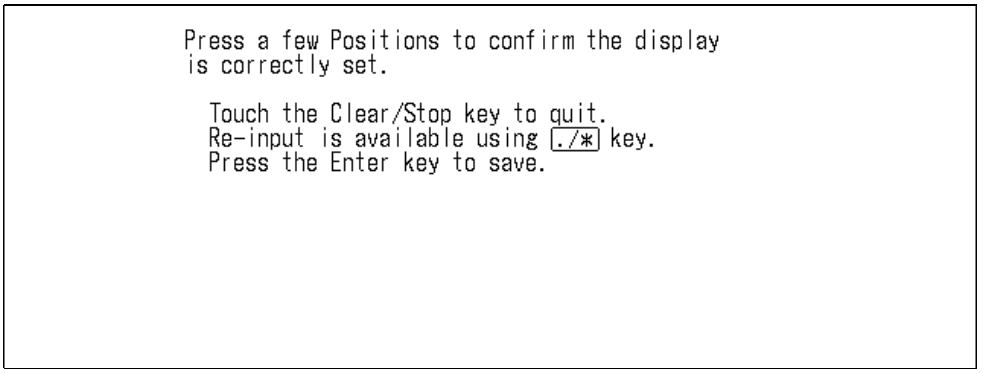

[A]
Touch Panel Coordinate Axis is being corrected.
Touch the + mark in front of the arrow.
Touch the Clear/Stop key to quit.
Re-input is available using ./* key.

A246M566.PCX


Touch Panel Coordinate Axis is being corrected.
Touch the Clear/Stop key to quit.
Re-input is available using ./* key.
Touch the + mark in front of the arrow.
[B]

A246M567.PCX

2. Follow the guidance on the LCD.
3. Touch the upper left corner [A].
4. Touch the lower right corner [B].
   NOTE: When touching the corner, do not touch inaccurately with finger but touch the corner precisely using a sharp object such as a pen (do not press too hard to avoid any damage).


Press a few Positions to confirm the display
is correctly set.
Touch the Clear/Stop key to quit.
Re-input is available using ./* key.
Press the Enter key to save.

A246M568.PCX

5. Touch a few positions to confirm that the touch panel is correctly adjusted.
   NOTE: When a part of the touch panel display is touched, the responding position indicates a “+” mark. If this “+” mark is more than 7 mm away from the actually touched point, press the “Clear/Stop” key and start the adjustment from the beginning.
6. If the adjustment is correct, press the enter key “#”.
   NOTE: Do not skip this step, otherwise, the result of the latest adjustment is ignored.

5. PREVENTIVE MAINTENANCE SCHEDULE

5.1 PM TABLE

NOTE: The amounts mentioned as the PM interval indicate the number of prints.

Symbol key: C: Clean R: Replace L: Lubricate I: Inspect

	EM	150 (k)	300 (k)	450 (k)	Expected life (k)	NOTE
OPTICS						
Mirrors, Lens, Reflectors		C	C	C		Cotton pad with water, or blower brush.
Exposure Glass	C	C	C	C		Alcohol or glass cleaner
Scanner Guide Rails		I	I	I		Optics cloth
ADS, Original Size Sensor	C	C	C	C		Blower Brush
Exposure Lamp		C	C	C		Dry cloth or alcohol
Toner Shield Glass	C	C	C	C		Optics cloth
Scanner/Lens Guide Rods		L	L	L		Launa oil
V_D,V_L, ADS Pattern	C	C	C	C		Water
APS Sensor					8,000 hours	
AROUND THE DRUM						
Charge Corona Wire		C	C	C	300	Replace if necessary Dry cloth (SP9-4-1)
Corona Wire Cleaner	C	C	C	C	300	Replace if necessary Dry cloth
Charge Corona Casing/ End Block		C	C	C		Replace if necessary Damp cloth
Charge Grid		C	C	C	300	Replace if necessary Dry cloth (SP9-4-3)
Quenching Lamp		C	C	C		Dry cloth
ID Sensor		C	C	C		Dry cloth
Erase Lamp Unit		C	C	C		Dry cloth
Pick off Pawl		C	C	C		Dry cloth Replace if necessary
Drum Potential Sensor		C	C	C		Dry cloth
Cleaning Blade		C	C	C	400	Dry cloth Replace if necessary (SP9-1-4)
Cleaning Entrance Seals		C	C	C		Empty used toner
Cleaning Brush		C	C	C	400	Replace if necessary (SP9-1-4)
Toner Collection Bottle		C	C	C		
Cleaning Side Seals		C	C	C		
DEVELOPMENT UNIT						
Developer			R			
Side Seals		I	I	I		Dry cloth or blower brush
Development Filter		R	R	R		
Entrance Seal		C	C	C		Dry cloth or blower brush

	EM	150 (k)	300 (k)	450 (k)	Expected life (k)	NOTE
Pressure release filter - Large		R	R	R		Vacuum Cleaner
Pressure release filter - Small		R	R	R		Vacuum Cleaner
Toner Bottle Holder Gear		L	L	L		Lubricate with Mobil Temp. 78
Toner Receiver		C	C	C		Blower brush
Toner Bottle Holder		C	C	C		Dry cloth
PAPER FEED						
Registration Rollers		C	C	C		Water or alcohol
Relay Rollers		C	C	C		Water or alcohol
Paper Dust Cleaner		C	C	C		Dry cloth
Paper Feed Rollers (1st, 2nd, 3rd Tray)	C	C	C	C	200	Replace if necessary Replace pick-up, feed, and separation rollers as a set. SP9-2-1 (1st) SP9-2-2 (2nd) SP9-2-3 (3rd)
Paper Feed Rollers (By-pass)	C	C	C	C	200	Replace if necessary Replace pick-up, feed, and separation rollers as a set. SP9-3-2
Registration Sensor		C	C	C		Blower brush
Paper Feed Guide Plate		C	C	C		Dry cloth
Vertical Transport Rollers		C	C	C		Water
TRANSFER BELT UNIT						
Transfer Belt		C	C	C	450	Dry cloth Replace if necessary SP9-4-2
Transfer Belt Cleaning Blade		C	C	C	450	Replace if necessary SP9-4-4
Belt Drive/Guide/ Bias Rollers		C	C	C		Dry cloth
FUSING/PAPER EXIT						
Hot Roller		C	C	C	300	Replace if necessary. SP9-5-1
Hot Roller Bearings		I	I	I	600	Replace if necessary.
Pressure Roller		C	C	C	450	Replace if necessary SP9-5-2
Pressure Roller Bearings		I	I	I	450	Replace if necessary.
Fusing Thermistor		C	C	C		Suitable solvent
Hot Roller Strippers	C	C	C	C	600	Water or alcohol SP9-5-3
Oil Supply Roller		R	R	R		Replace with oil supply cleaning blade as a set.
Oil Supply Roller Bushings	I	I	I	I		Replace if necessary

	EM	150 (k)	300 (k)	450 (k)	Expected life (k)	NOTE
Oil Supply Cleaning Roller		R	R	R		Replace with oil supply roller as a set.
Oil supply Cleaning Brush		R	R	R		Replace with oil supply cleaning roller as a set.
Pressure Roller Cleaning Roller and Bearings		R	R	R		Replace as a set.
Fusing Entrance and Exit Guides		C	C	C		Suitable solvent
Fusing Lamp		C	C	C		Check connection of terminals
DUPLEX						
Feed Roller		C	C	C	100	Replace if necessary SP9-3-3
Separation Belt		C	C	C	100	Replace if necessary SP9-3-3
Pick-up Roller		C	C	C		Alcohol
Reverse Roller				C		Replace if necessary
Duplex Drive Belt		C	C	C		Check and adjust drive belt tension
Duplex Paper End Sensor		C	C	C		Blower brush
OTHERS						
Dust Filter		R	R	R		
Ozone Filter			R			

	EM	150 (k)	300 (k)	450 (k)	Expected Life (k)	NOTE
ADF						
Transport Belt	C	C	C	C		Belt cleaner Replace if necessary
Separation Belt	C	C	C	C	80	Alcohol Replace if necessary SP9-3-4
Feed Roller	C	C	C	C	80	Alcohol Replace if necessary SP9-3-4
Sensors	C	C	C	C		Blower brush
Pick-up Roller	C	C	C	C		Alcohol Replace if necessary

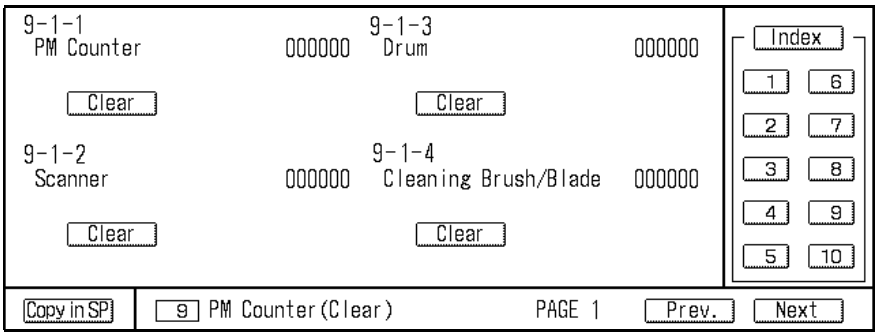
	EM	150 (k)	300 (k)	450 (k)	Expected Life (k)	NOTE
LCT						
Paper Feed Roller		C	C	C	200	Replace if necessary
Pick-up Roller		C	C	C	200	Replace pick-up, feed, and separation rollers as a set. SP9-3-1
Separation Roller		C	C	C	200	

	EM	150 (k)	300 (k)	450 (k)		NOTE
SORTER STAPLER						
Rollers	C	C	C	C		Water
Bins		C	C	C		Water
Bushings		L	L	L		Use Launa Oil
Gears		L	L	L		Gease-501
Sensors		C	C	C		Blower bursh
Punch Waste Hopper	I	I	I	I		Empty the hopper.

5.2 PM PROCEDURE

5.2.1 CLEARING PM COUNTER

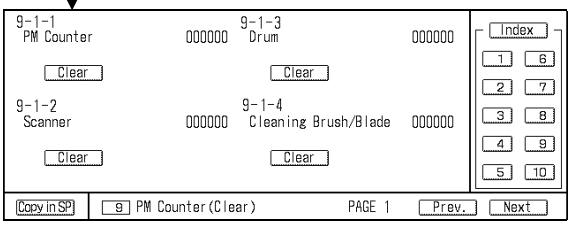
After carrying out the PM, clear the PM counter (SP9-1-1).



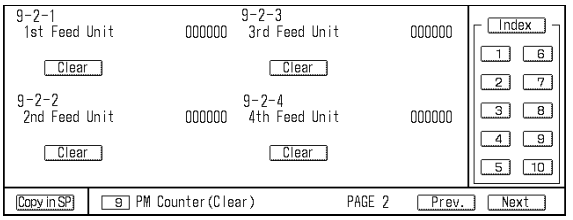
A246P500.PCX

5.2.2 PM PROCEDURE

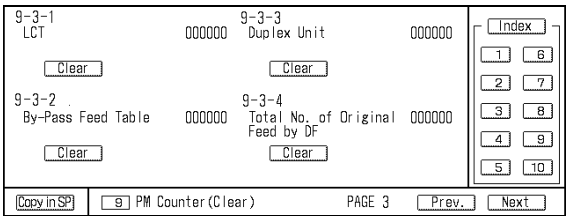
Check the total counter each PM counter.



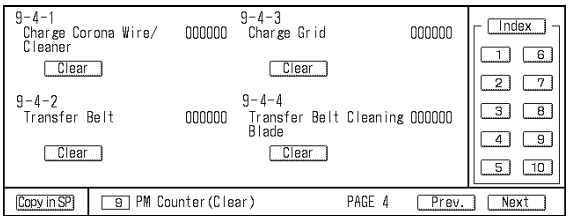
A246P500.PCX



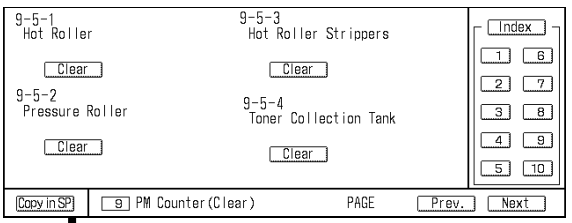
A246P501.PCX



A246P502.PCX



A246P503.PCX



A246P504.PCX

1. Make a copy

Make a copy of an O-S-A3 test chart at manual image density level 5.

2. PM

In accordance with the PM table carry out PM.
1) Refer to the PM counter to determine which PM items should be replaced.
2) Clean the appropriate PM counters in SP mode.

3. Check after PM

Check the machine operation, and copy quality.

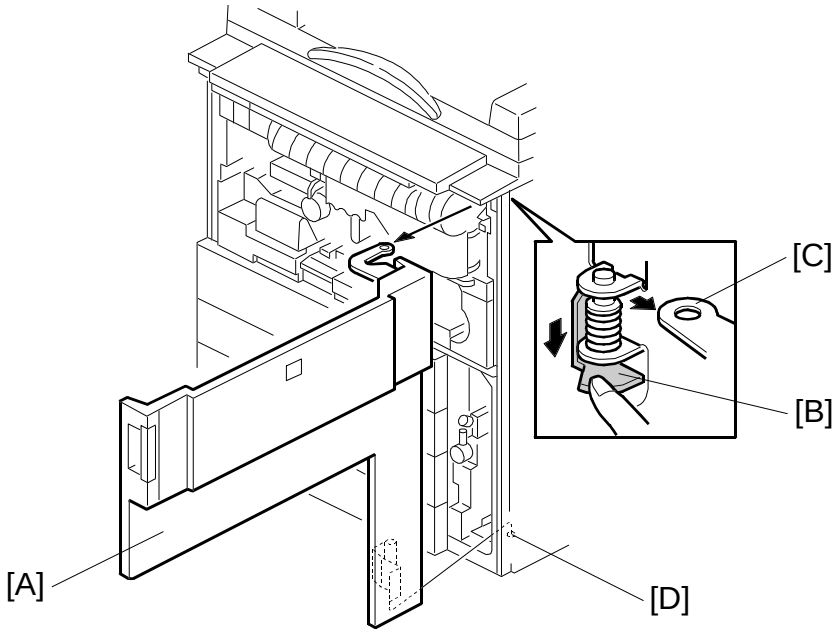
4. Check the total counter

6. REPLACEMENT AND ADJUSTMENT

6.1 EXTERIOR AND INNER COVER REMOVAL

6.1.1 FRONT COVER

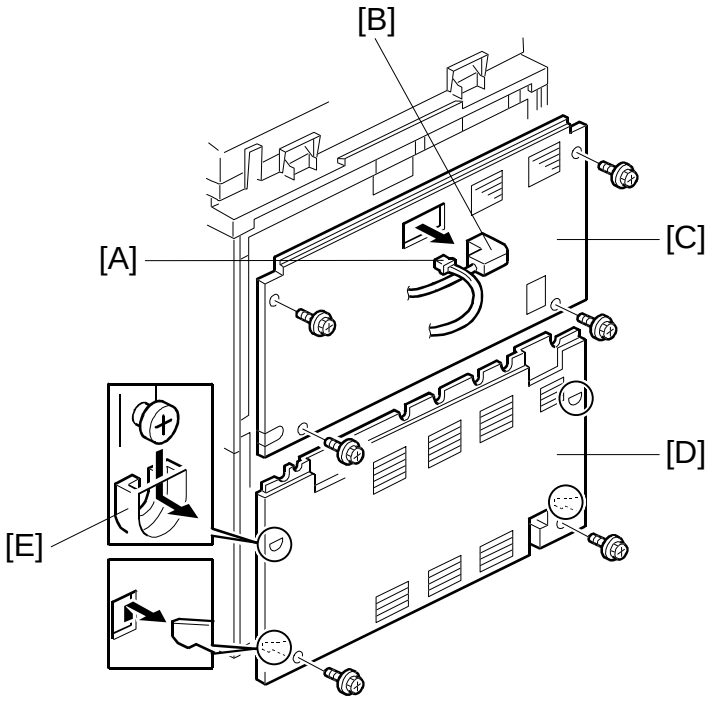
NOTE: Always support the front cover with one hand when removing it. Otherwise, the bottom hinge pin might break.



A246R500.WMF

1. Open the front cover [A].
2. While supporting the front cover, lower the upper pin [B] to unhook the upper hinge bracket [C].
3. Slightly lift the front cover and remove it from the hole [D].

6.1.2 REAR SIDE



A246R501.WMF

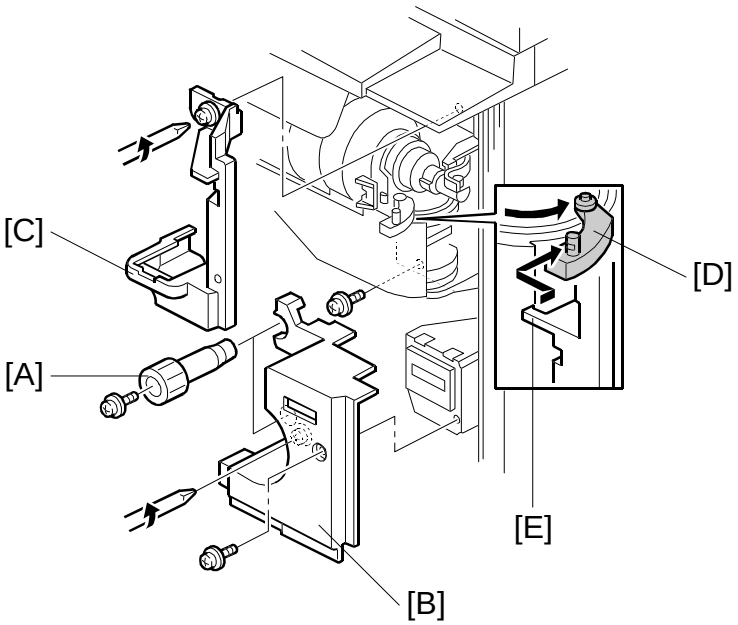
Upper Rear Cover

1. Turn off the main switch.
2. If the document feeder is installed, disconnect the fiber optics connectors [A, B].
   NOTE: After the upper rear cover is re-installed, set the fiber optics connectors so that the fiber optics cable [A] is over the electrical cable [B]. Also, make sure the fiber optics cable does not bend while opening and closing the document feeder.
3. Remove the upper rear cover [C] (4 screws).

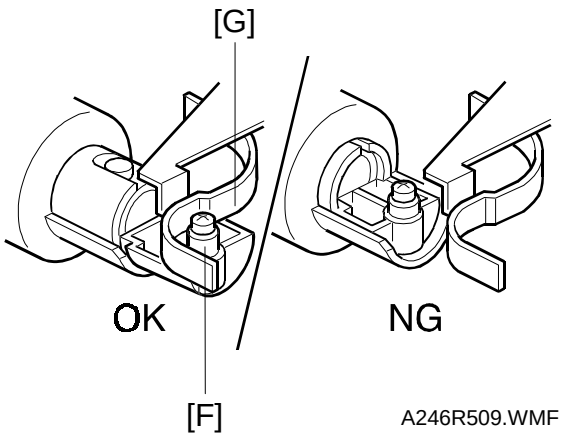
Lower Rear Cover

1. Remove the lower cover [D], as shown (2 screws).
   NOTE: When reinstalling the lower cover, first set the lower cover guide [E].

6.1.3 INNER COVER



A246R506.WMF



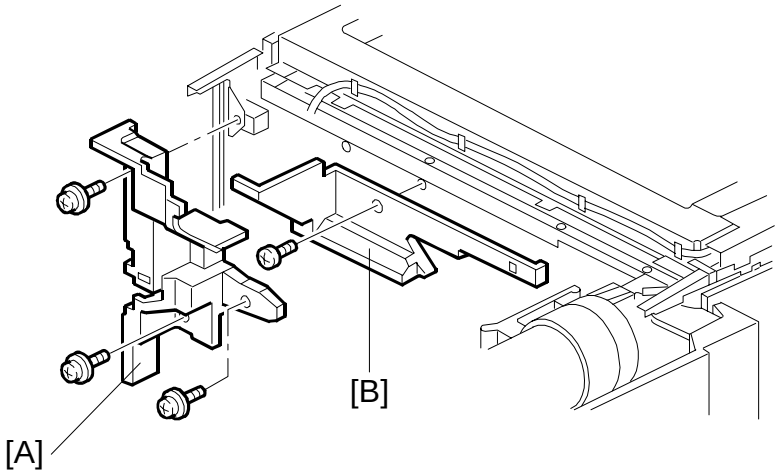
A246R509.WMF

Right Inner Cover

1. Open the front cover.
2. Remove the knobs [A] (1 screw each).
3. Pull out the duplex tray.
4. Remove the right inner cover [B] (2 screws).

Shutter Inner Cover

1. Open the front cover.
2. Remove the shutter inner cover [C] (1 screw).
   NOTE: 1) When re-installing the shutter cover, hang the shutter lever [D] on the hook [E].
   2) When re-installing the projection [F] of the toner bottle holder, set it on the right side of bracket [G]. Otherwise, toner is not supplied.



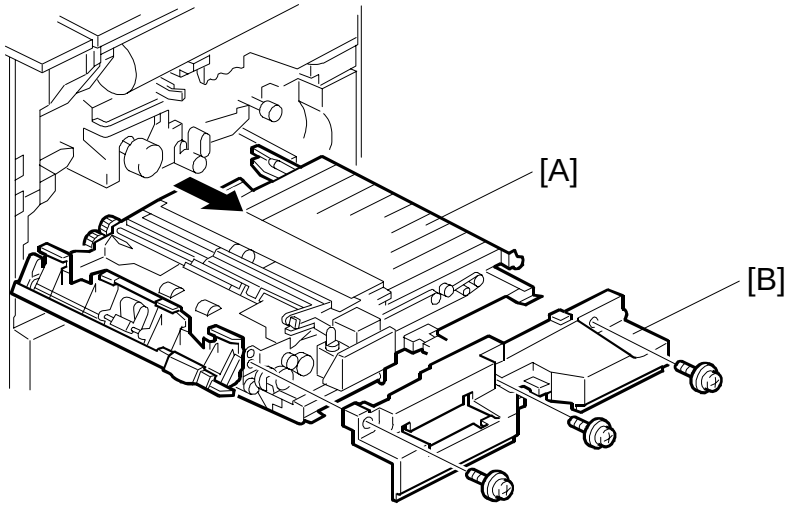
A246R507.WMF

Left Inner Cover

1. Open the front cover.
2. Remove the left inner cover [A] (3 screws).

Upper Inner Cover

1. Open the front cover.
2. Remove the upper inner cover [B] (1 screw).

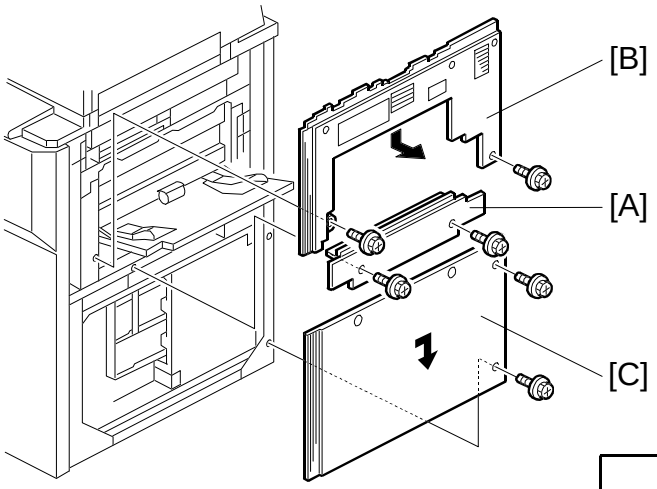


A246R508.WMF

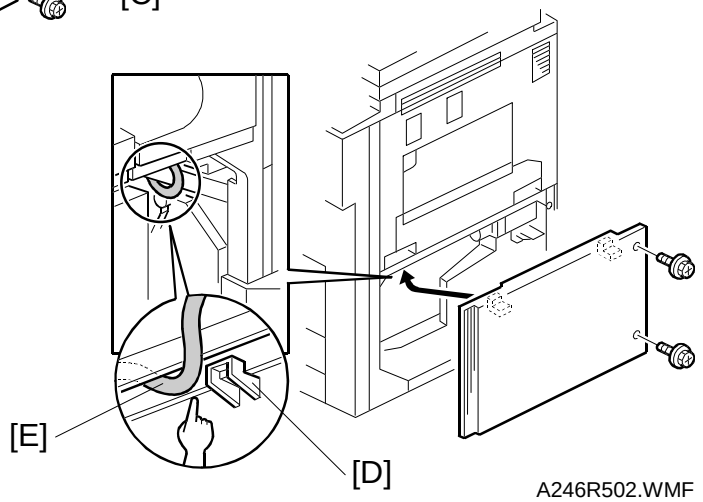
Duplex Inner Cover

1. Open the front cover.
2. Draw out the duplex unit [A].
3. Remove the duplex inner cover [B] (3 screws).

6.1.4 RIGHT SIDE



A246R720.WMF



A246R502.WMF

Feed Unit Cover

1. Remove the feed unit cover [A] (2 screws).

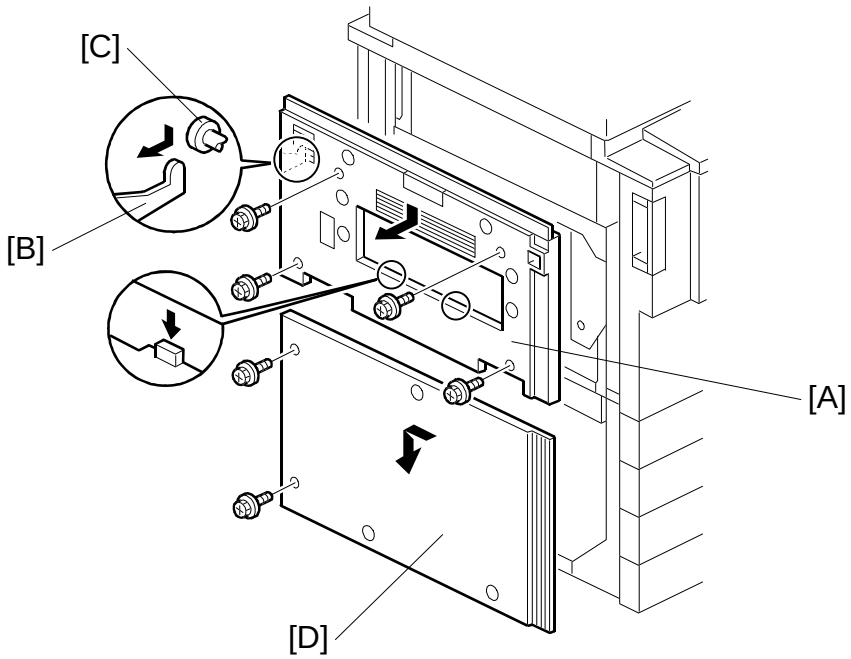
Upper Right Cover

1. Remove the feed unit cover.
2. Open the by-pass table.
3. Slightly shift the upper right cover [B] downward and remove it (2 screws).
   NOTE: When re-installing the upper right cover, make sure that the hook meets the stepped screw.

Lower Right Cover

1. Slightly shift the lower right cover [C] to the right and remove it (2 screws).
   NOTE: 1) When re-installing the lower right cover, set the hooks in the holes on the frame.
   2) When re-installing the lower right cover, make sure that the hook [D] does not pinch the toner recycling tube [E].

6.1.5 LEFT SIDE



A246R503.WMF

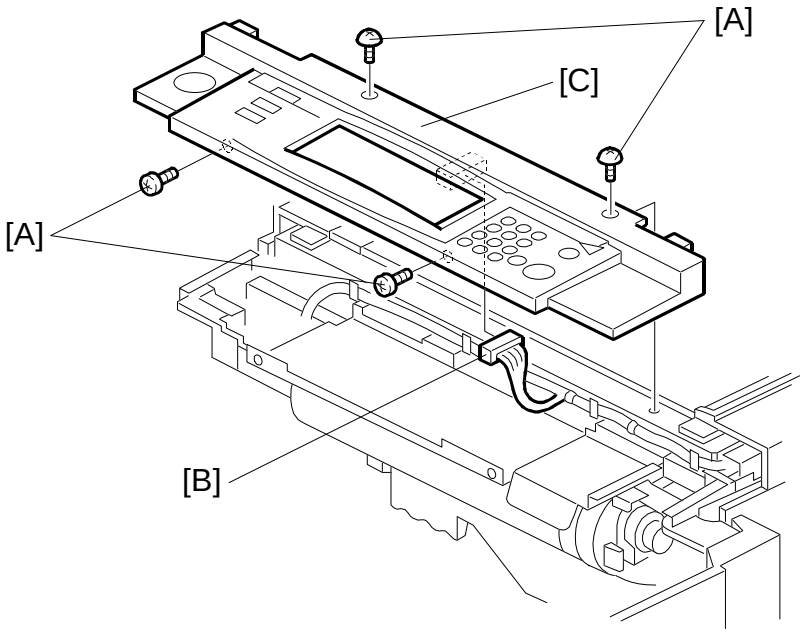
Upper Left Cover

1. Slightly shift the upper left cover [A] downward and remove it (2 M4 x 8 screws: upper, 2 M4 x 12 screws: lower).
   NOTE: When re-installing the upper left cover, make sure the hook [B] meets the stepped screw [C].

Lower Left Cover

1. Slightly shift the lower left cover [D] to the left and remove it (2 screws).
   NOTE: When re-installing the lower left cover, set the hooks in the holes on the frame.

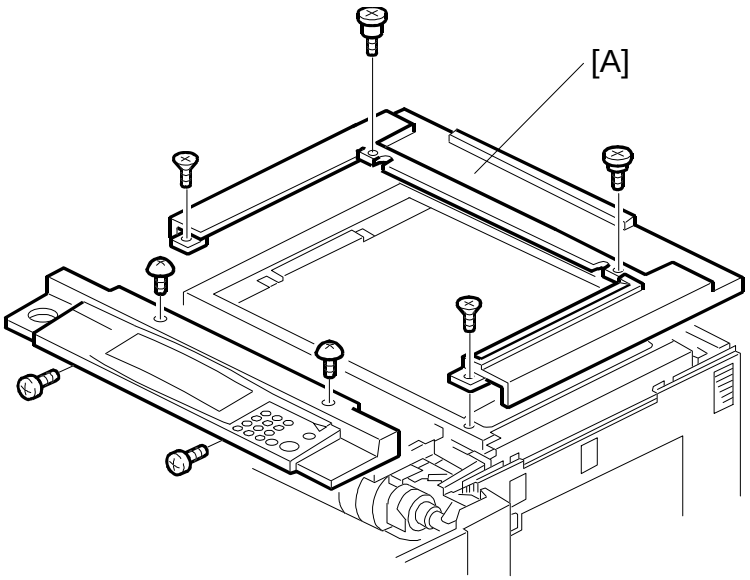
6.1.6 OPERATION PANEL



A246R504.WMF

1. Turn off the main switch.
2. Open the front cover.
3. Remove the four screws [A].
4. Disconnect the connector [B].
5. Remove the operation panel [C].

6.1.7 UPPER COVER

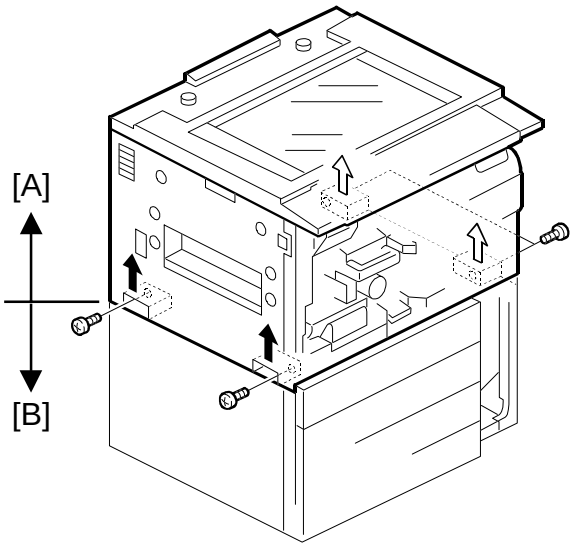


A246R505.WMF

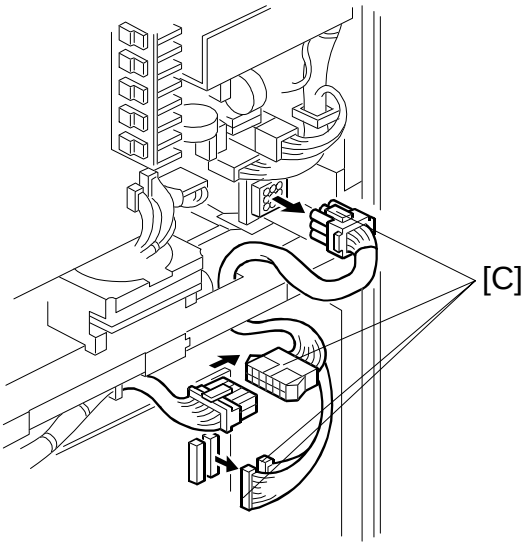
1. Remove the document feeder or platen cover.
2. Remove the operation panel. (Refer to Operation Panel Removal, section 6.1.6.)
3. Remove the upper cover [A] (4 screws).

6.2 PAPER FEED

6.2.1 PAPER TRAY UNIT REMOVAL



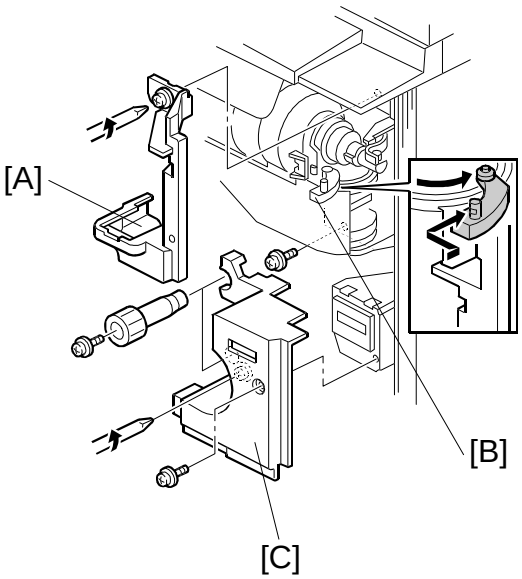
A246R510.WMF



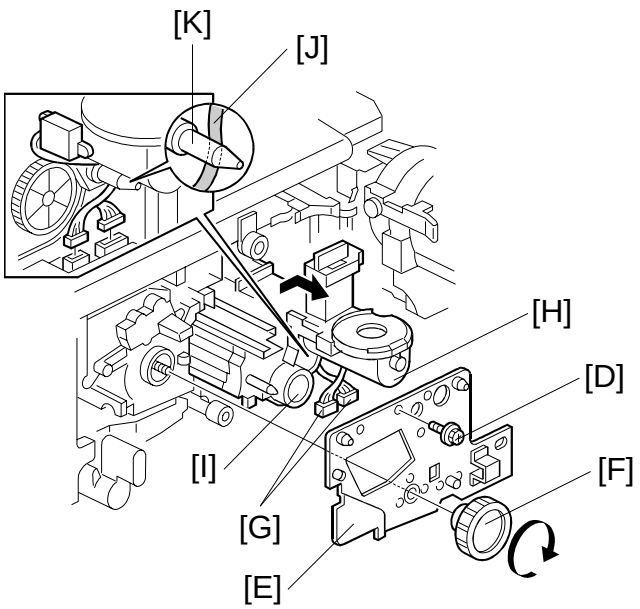
A246R511.WMF

To facilitate transportation, the upper part of the copier (copier main frame) [A] and the lower part of the copier (paper tray unit) [B] can be separated in the following manner:

1. Turn off the main switch.
2. Remove the document feeder or the platen cover.
3. Remove the front cover. (Refer to Front Cover Removal, section 6.1.1.)
4. Remove the upper rear cover. (Refer to Upper Rear Cover Removal, section 6.1.2.)
5. Remove the lower rear cover. (Refer to Lower Rear Cover Removal, section 6.1.2.)
6. Disconnect the four connectors [C].



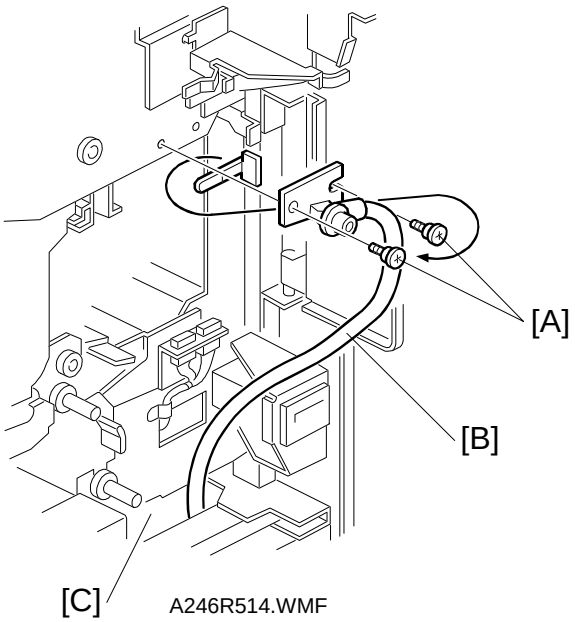
A246R705.WMF



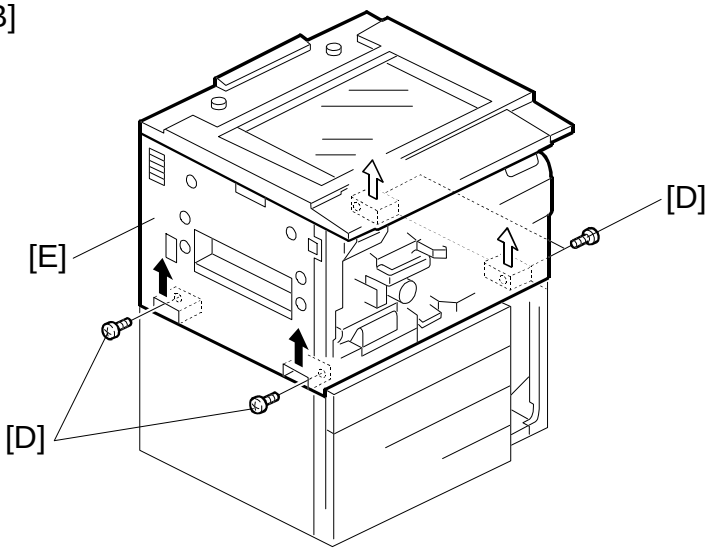
A246R513.WMF

7. Remove the shutter inner cover [A]. (Refer to Shutter Inner Cover Removal, section 6.1.3.)
8. Release the shutter lever [B] fully to the front.
9. Swing out the toner bottle holder (1 screw).
10. Remove the lower right inner cover [C]. (Refer to Lower Right Inner Cover, section 6.1.3.)
11. Remove the screw [D] securing the drum stay [E].
12. Remove the drum stay knob [F] then take out the drum stay.
13. Disconnect the two connectors [G].
14. Pull out the development unit [H].

NOTE: 1) To prevent drum scratches, push the development unit to the right while pulling it out.
2) When re-installing the drum stay, be careful not to pinch the harness. Also, keep the harness away from the gears.
3) When pulling out the development unit, do not pull the knob [I].
4) When re-installing the development unit, install the harness [J] to the right of the pin [K], as shown.



A246R514.WMF

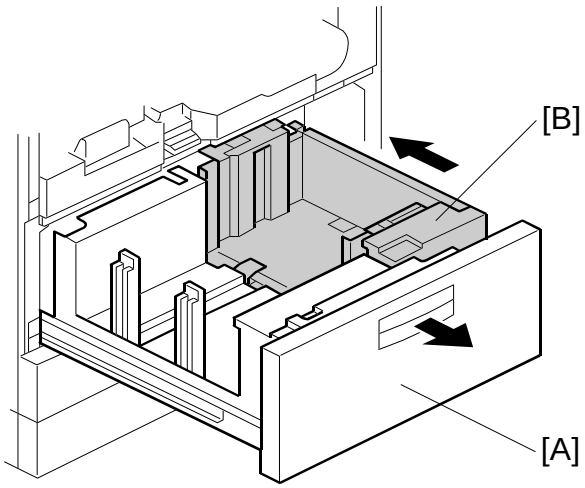


A246R510.WMF

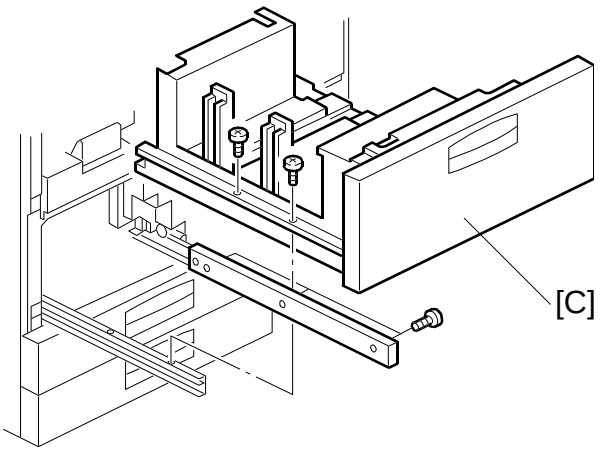
15. Remove the two screws [A] securing the tube [B] of toner recycle.
16. Put the whole tube into the paper tray unit through the opening [C].
    NOTE: Refer to Transportation Remarks, section 3.10, if the machine has been already copied over 1,000 sheets. There may be toner in the tube.
17. Remove the four screws [D].
18. Remove the copier main frame [E] from the paper tray unit.
    NOTE: When re-installing the main frame, be careful not to pinch the harness and a tube.

6.2.2 PAPER TRAY REMOVAL

Tandem Tray Removal

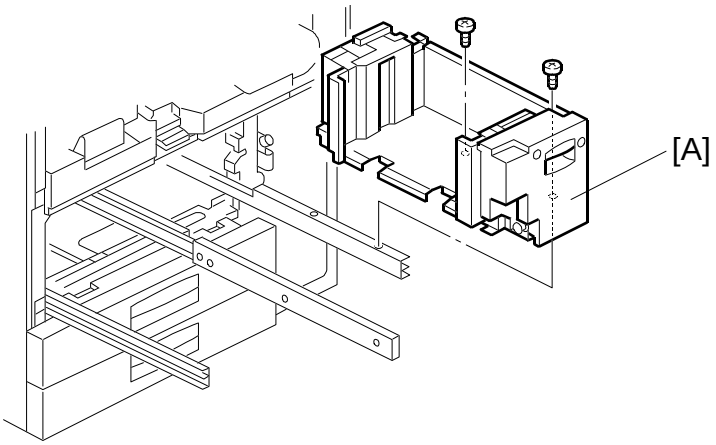


A246R515.WMF

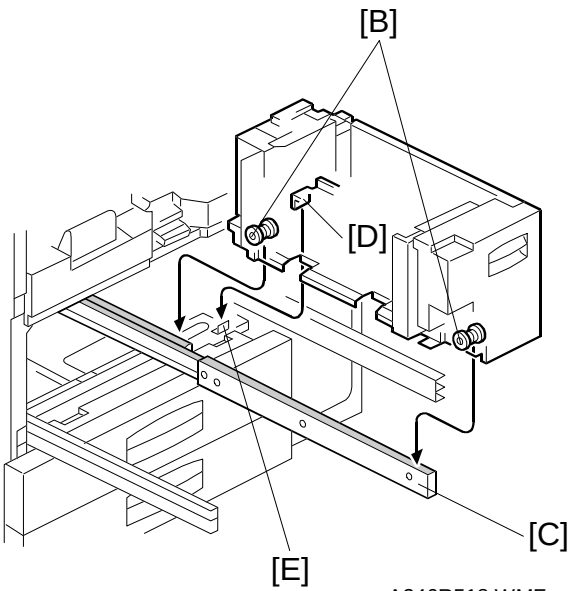


A246R516.WMF

1. Open the front cover.
2. Draw out the tandem feed tray [A] fully to separate the right tandem tray [B] from the left one.
3. Remove the left tandem tray [C] (5 screws).



A246R517.WMF

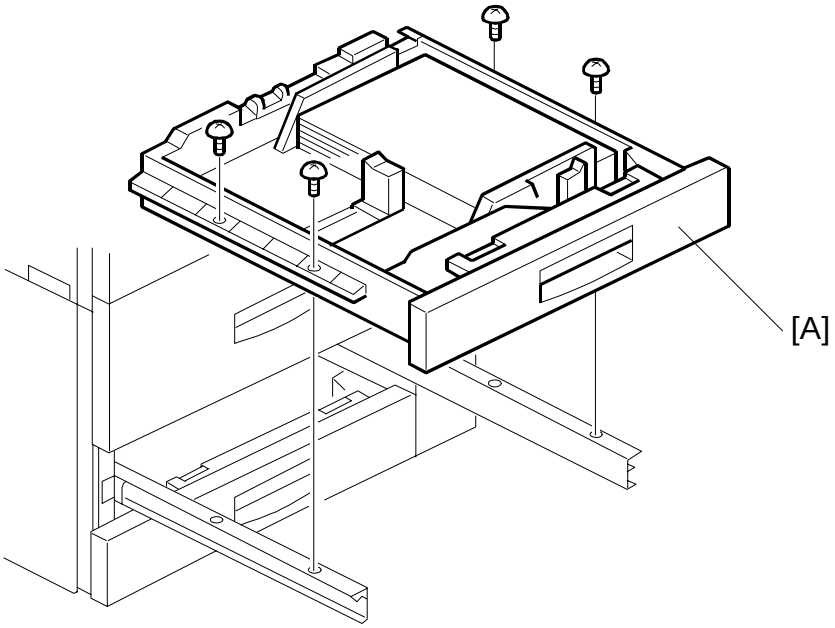


A246R518.WMF

4. Remove the right tandem tray [A] (2 screws).

NOTE: 1) When re-installing the right tandem tray, make sure that the wheels [B] ride on the slide rail [C].
2) When re-installing the right tandem tray, make sure that the tandem tray stopper [D] is set behind the stopper [E] of the copier frame.

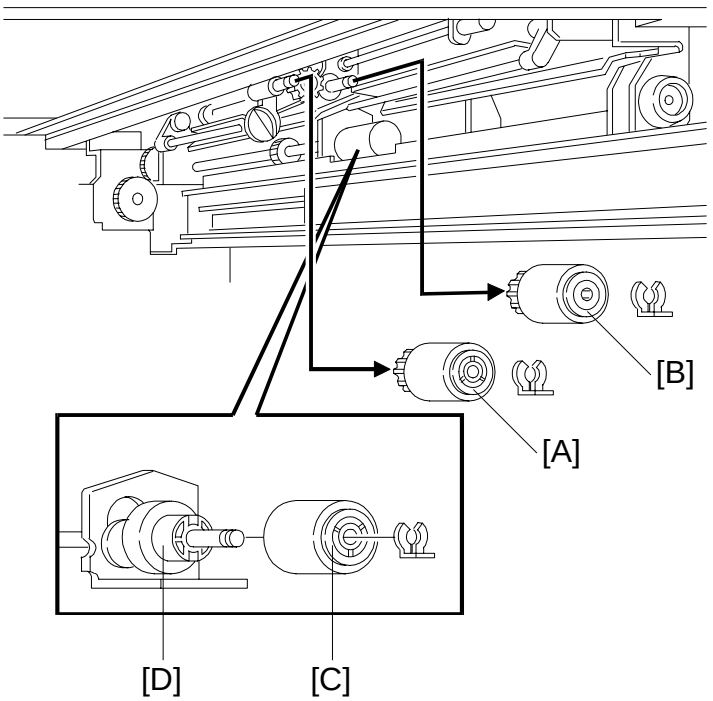
Universal Tray/550 Sheet Tray Removal



A246R554.WMF

1. Draw out the tray.
2. Remove the tray [A] from both guide Accurides, as shown.

6.2.3 PAPER FEED ROLLERS REPLACEMENT

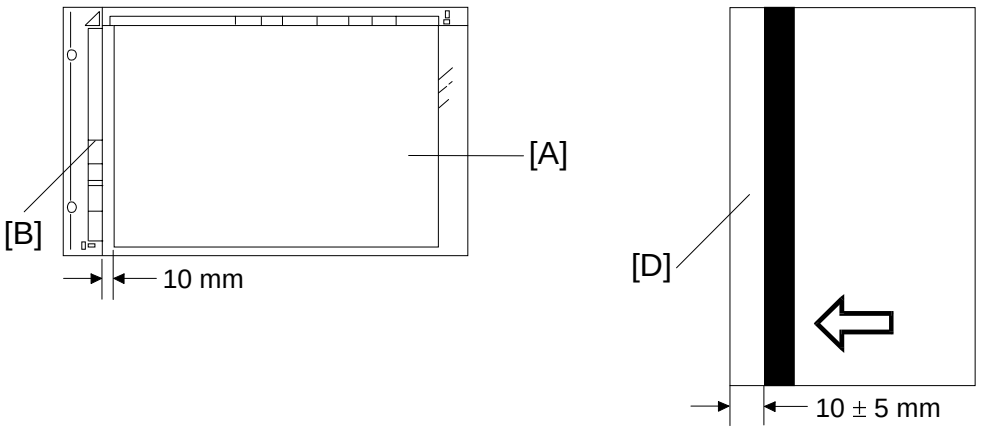


A246R544.WMF

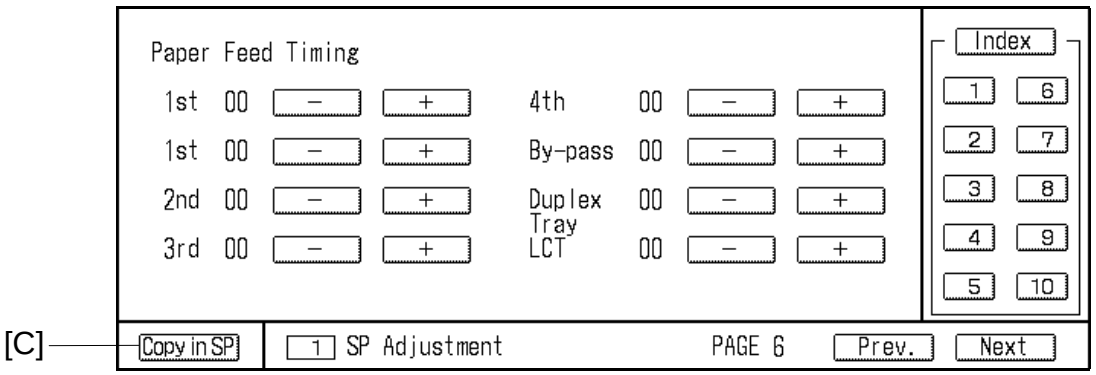
1. Turn off the main switch.
2. Remove the paper tray where the feed rollers belong to. (Refer to Paper Tray Removal, section 6.2.2.)
3. Remove the pick-up roller [A] (1 snap ring).
4. Remove the feed roller [B] (1 snap ring).
5. Remove the separation roller [C] from the torque limiter [D] (1 snap ring).

NOTE: 1) The paper feed (pick-up, feed, separation) rollers used in the 1st ~ 3rd feed units in the paper tray unit are different from the feed rollers used in the by-pass feed table and 3.5 k LCT. They are not interchangeable.
2) Do not touch the surface of the rollers with your hand.

6.2.4 PAPER FEED TIMING ADJUSTMENT



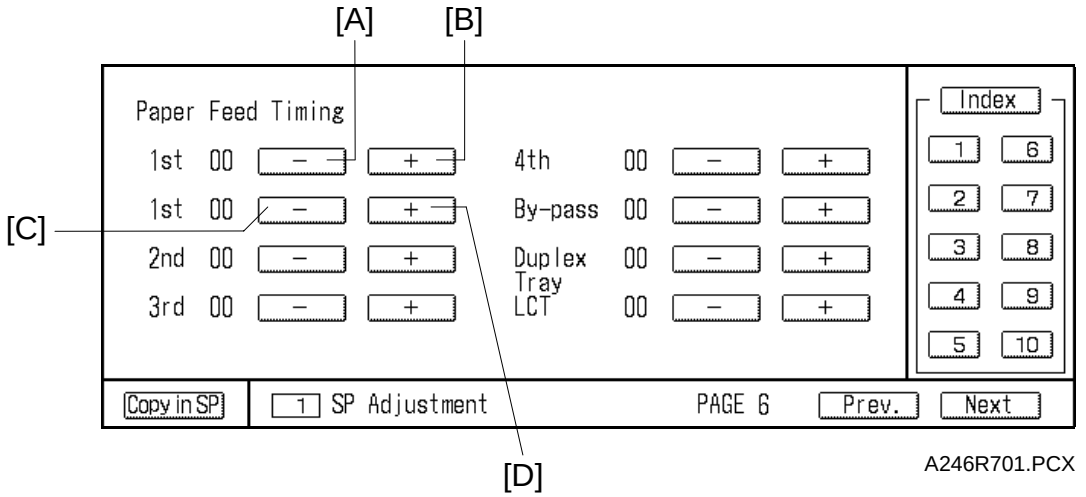
A246R545.WMF



A246R701.PCX

1) Paper feed timing adjustment for the 1st feed station

1. Place a white paper on the exposure glass so that there is a gap of 10 mm between the white paper [A] and the left scale [B].
2. Enter SP mode (refer to Service Program Access Procedure) and access the SP1-6-1 (Paper Feed Timing).
3. Touch the **"Copy in SP"** key [C] then select the 1st feed station.
4. Enter a copy quantity of "2" using the number keys.
5. Touch the **"SP Mode"** key.
6. Press the **"Start"** key and evaluate the width of the white area [D] on the copy. The adjustment standard is 10 ± 5 mm.
   NOTE: In this mode, the registration roller does not stop for registration. Do not make copies in "Copy in SP" mode for this adjustment. In "Copy in SP" mode, the registration motor stops normally.



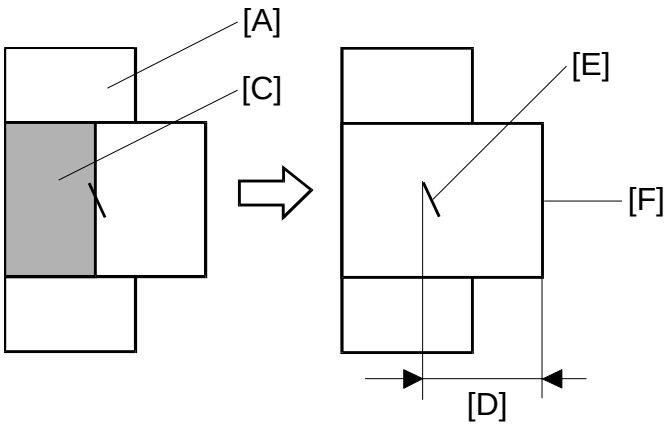
7. For the first copy, touch the – key [A] or the + key [B] to adjust the white area width.
8. For the second copy, touch the – key [C] or the + key [D] to adjust the white area width.
9. Repeat steps 6 to 8.
   NOTE: 1) The A246 copier requires steps 7 and 8.
   2) A247/A248 copiers, however, do not require step 7.

2) Paper feed timing adjustment for the 2nd, and 3rd feed stations, and the LCT and the duplex unit.

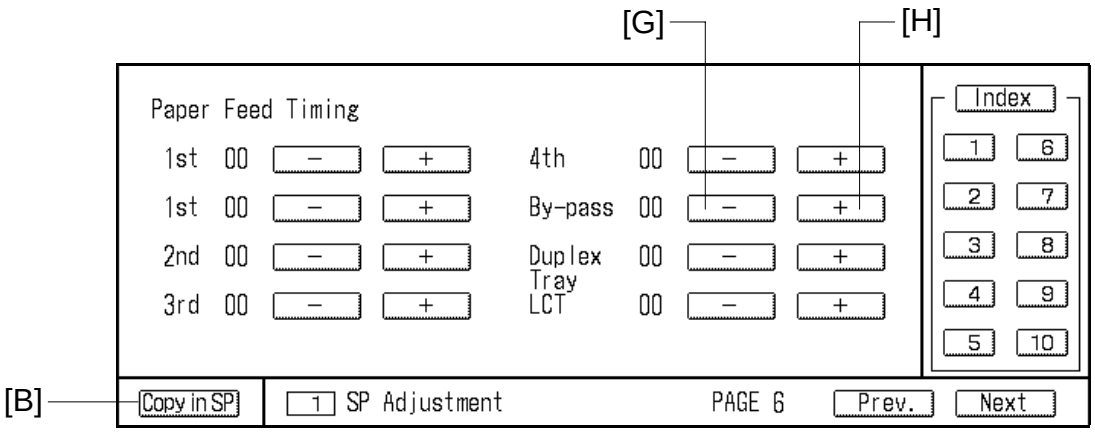
Refer to Paper Feed Timing Adjustment for the 1st feed station.

NOTE: For the 1st feed station, it is necessary to adjust the feed timing for the 1st and 2nd papers individually. However, for the other feed stations, it is necessary to adjust the feed timing only for the 1st paper fed.

Therefore, you can skip steps 4 and 7 of the paper feed timing adjustment for the 1st feed station.



A246R546.WMF

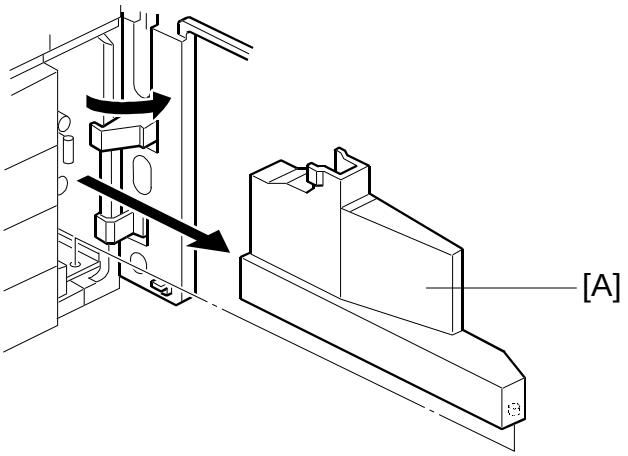


A246R701.PCX

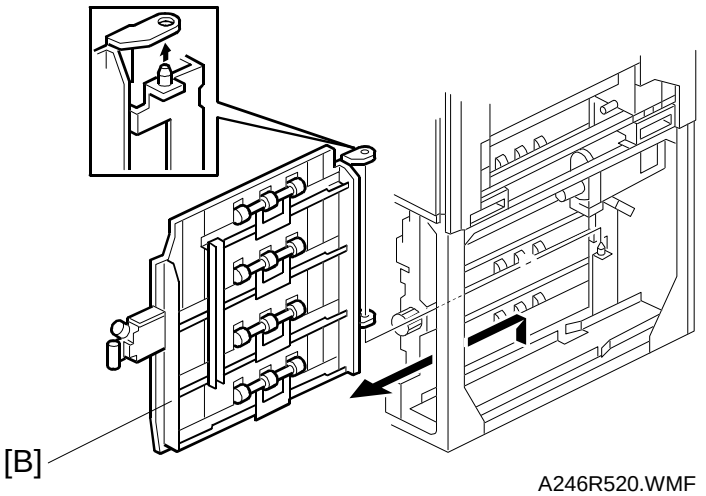
3) Paper feed timing adjustment for the by-pass feed station

1. Set two sheets of paper on the by-pass feed table [A].
2. Enter SP mode (refer to Service Program Access Procedure) and access SP1-6-1 (Paper Feed Timing).
3. Touch the **"Copy in SP"** key [B].
4. Select the by-pass feed station.
5. Press the **"Start"** key then when the paper stops for registration, mark the trailing edge [C] of the paper on the next paper as shown.
6. Measure the distance [D] between the leading edge of the mark [E] and the trailing edge of the paper [F] as shown. The adjustment standard is 106 ~ 115 mm.
7. Touch the **"SP Mode"** key.
8. Touch the – key [G] or the + key [H] to adjust the distance [D].
9. Touch the **"Copy in SP"** [B].
10. Repeat steps 5 to 9.

6.2.5 PAPER FEED CLUTCH REMOVAL (1ST TRAY PAPER FEED CLUTCH)

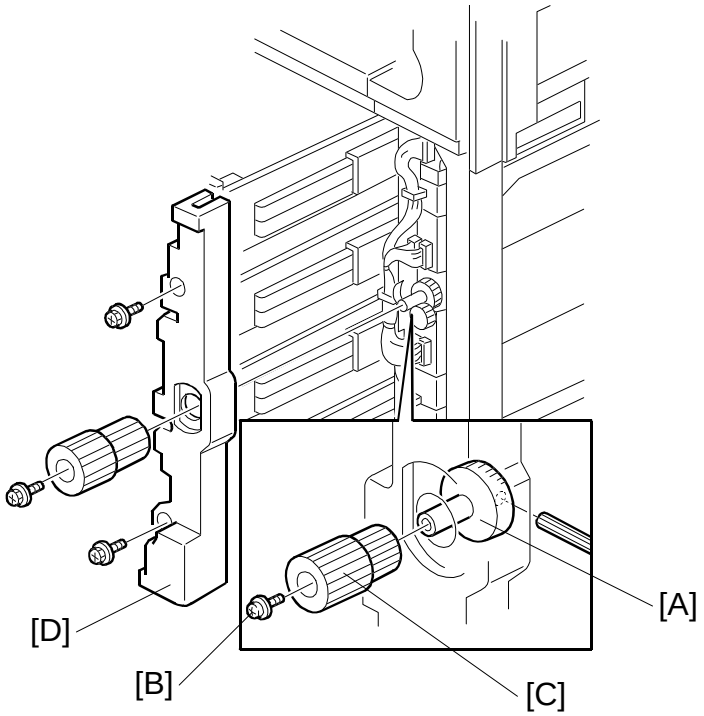


A246R519.WMF



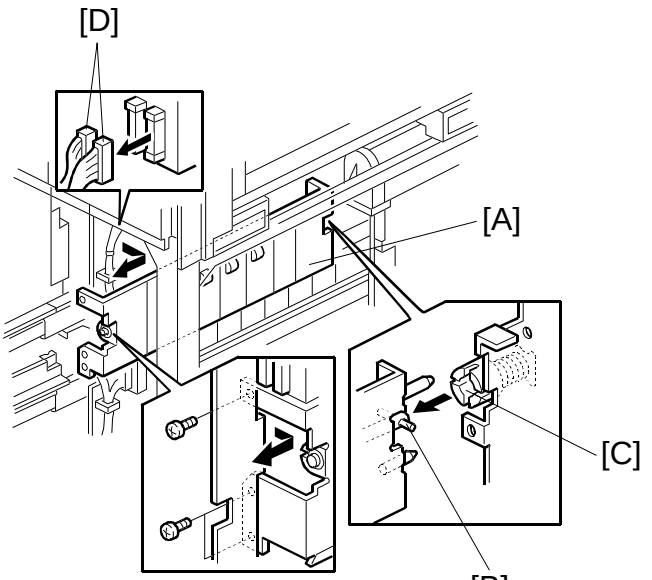
A246R520.WMF

1. Turn off the main switch.
2. Remove the front cover. (Refer to Front Cover Removal, section 6.1.1.)
3. Remove the lower right cover. (Refer to Lower Right Cover Removal, section 6.1.4.)
   NOTE: If the LCT is installed, remove it from the copier.
4. Remove the feed unit cover. (Refer to Feed Unit Cover Removal, section 6.1.4.)
5. Slightly shift the toner collection bottle [A] upward and remove it.
6. Slightly lift the vertical transport guide [B] and remove it.

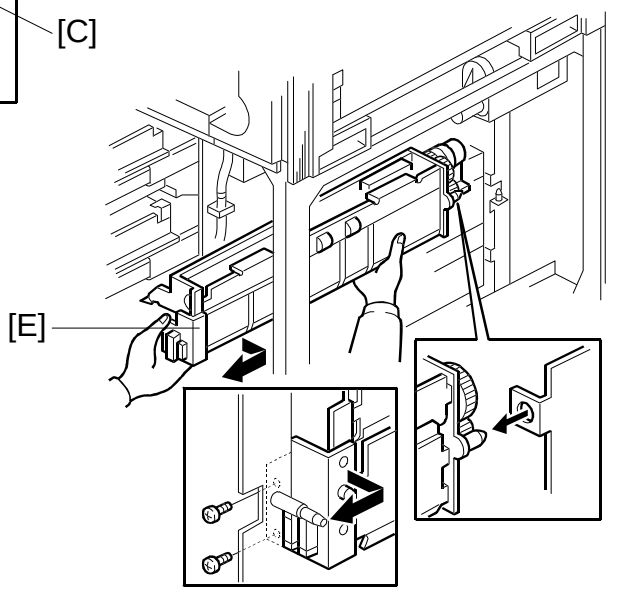


A246R521.WMF

7. While holding the shaft [A] with an Allen wrench, remove the securing screw [B], then remove the knob [C].
8. Pull out the paper trays and then remove the paper tray unit inner cover [D] (2 screws).

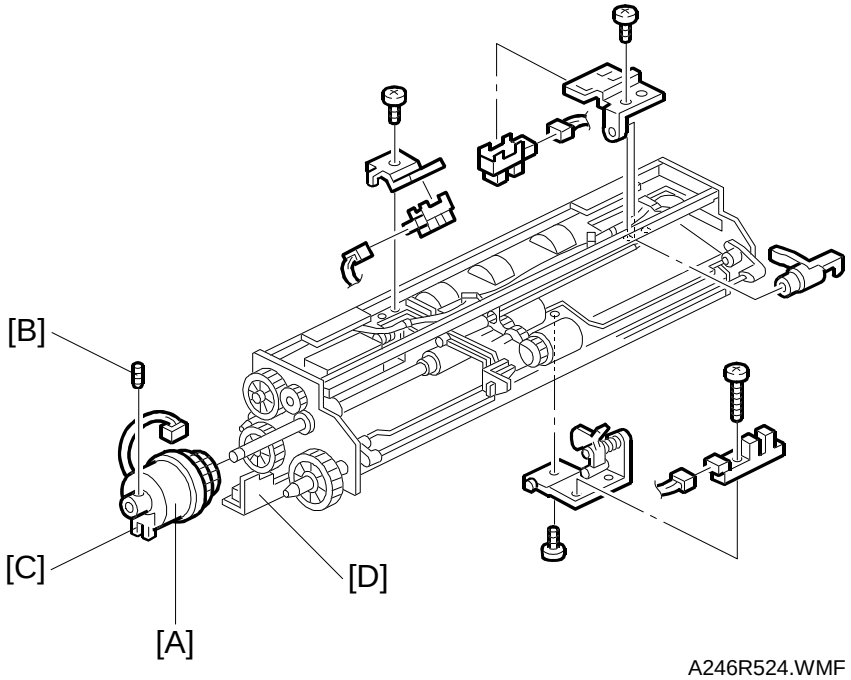


A246R522.WMF



A246R523.WMF

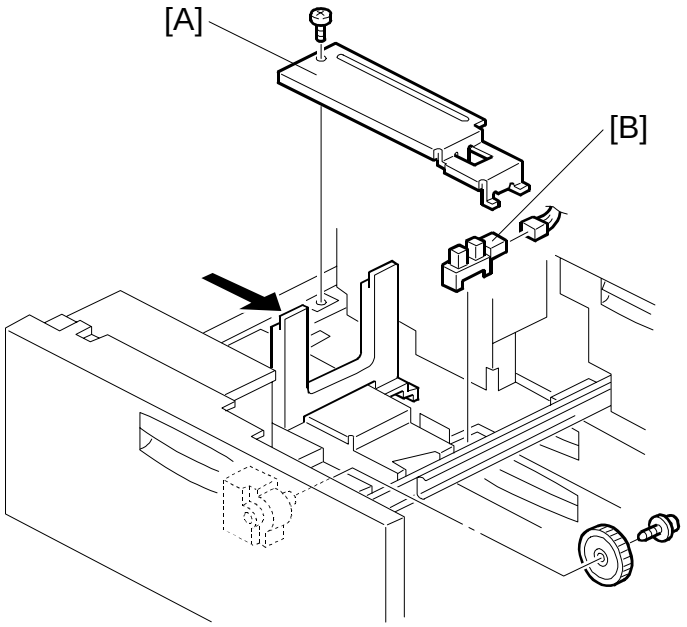
9. Hold the inner vertical transport guide [A] and pull out it (3 screws).
   NOTE: When re-installing the inner vertical transport guide, make sure to set the pin [B] of the inner vertical transport guide into the slot [C] on the main body.
10. Disconnect the two connectors [D].
11. Grasp the 1st paper feed unit [E] and pull it out (2 screws).
    NOTE: Before removing the 1st paper feed unit, remove the inner vertical transport guide [A]. Otherwise, the 1st paper feed unit may be damaged.



A246R524.WMF

12. Remove the paper feed clutch [A] (1 Allen screw [B]).
    NOTE: When re-installing the paper feed clutch, set the stopper [C] on the edge of the bracket [D], then push the clutch on the feed roller shaft in fully and secure the Allen screw.

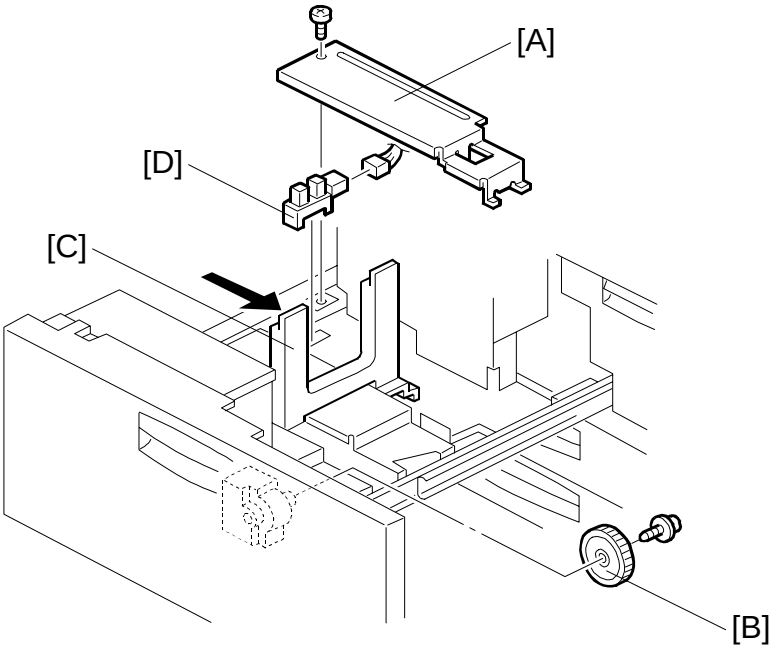
6.2.6 REAR FENCE RETURN SENSOR REPLACEMENT



A246R525.WMF

1. Turn off the main switch.
2. Draw out the tandem feed tray.
3. Remove the rear bottom plate [A] (1 screw).
4. Replace the return sensor [B] (1 connector).

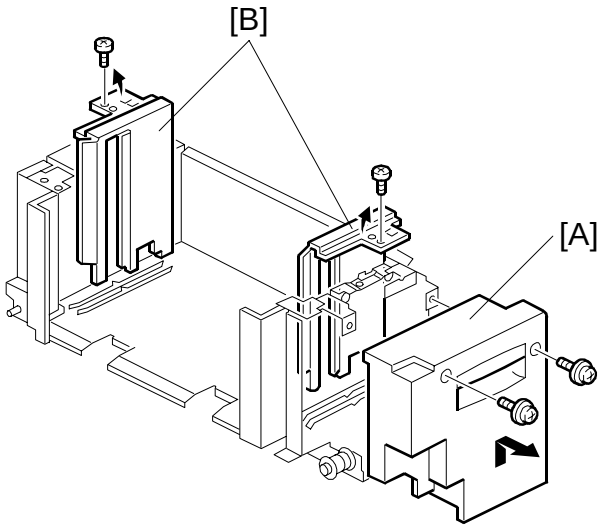
6.2.7 REAR FENCE HP SENSOR REPLACEMENT



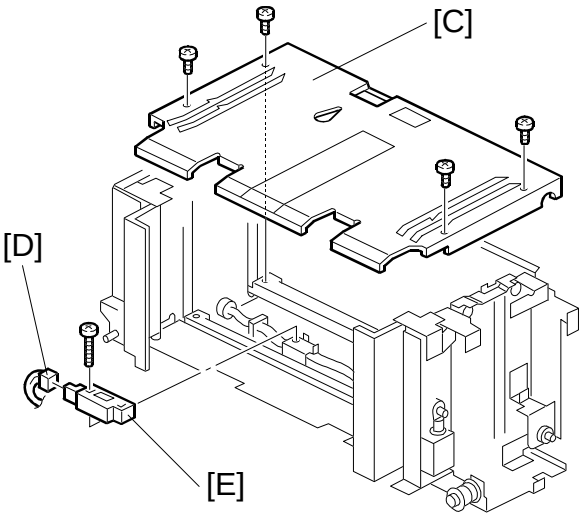
A246R525.WMF

1. Turn off the main switch.
2. Draw out the tandem feed tray.
3. Remove the rear bottom plate [A] (1 screw).
4. Remove the back fence transport gear [B] (1 screw).
5. Move the back fence [C] to the right.
6. Remove the rear HP sensor [D] (1 connector).

6.2.8 BOTTOM PAPER SENSOR REPLACEMENT



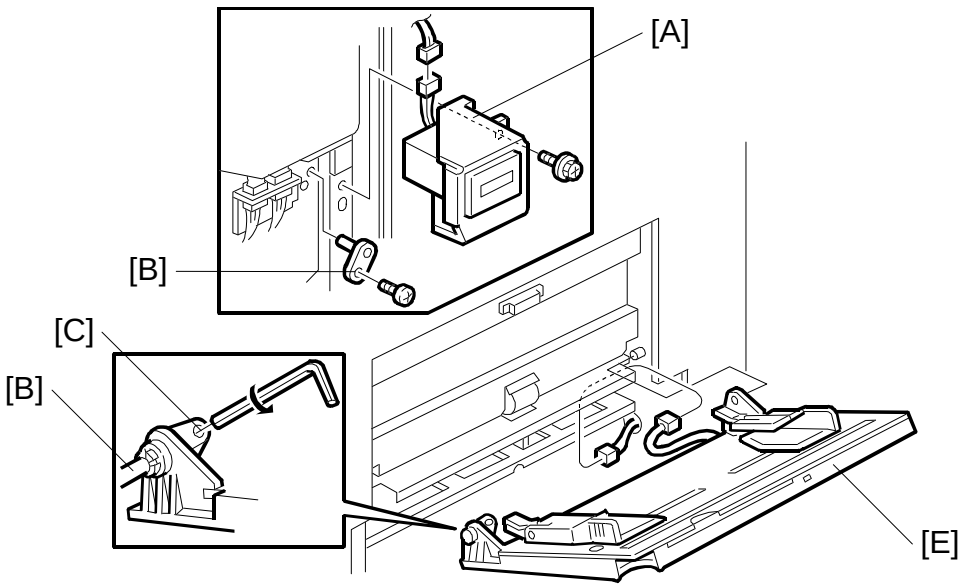
A246R543.WMF



A246R526.WMF

1. Turn off the main switch.
2. Remove the right tandem tray. (Refer to Paper Tray Removal, section 6.2.2.)
3. Remove the inner cover [A] (2 screws).
4. Remove the side fences [B] (1 screw each).
5. Remove the bottom plate [C] (4 screws).
6. Disconnect the connector [D].
7. Replace the bottom paper sensor [E] (1 screw).

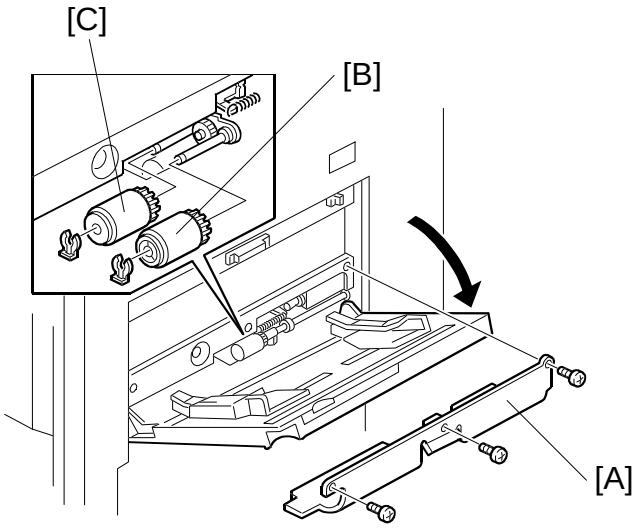
6.2.9 BY-PASS FEED TABLE REMOVAL



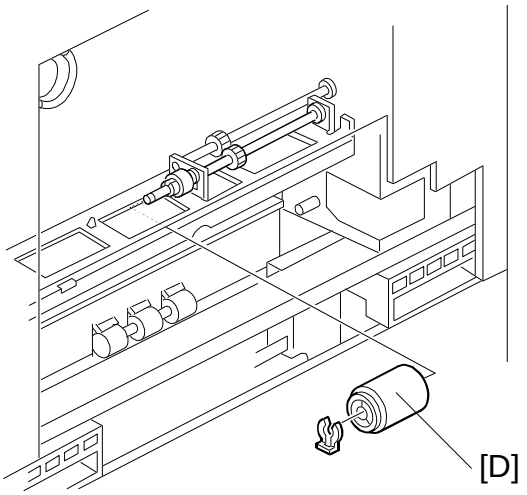
A246R547.WMF

1. Turn off the main switch.
2. Remove the right inner cover. (Refer to Right Inner Cover Removal, section 6.1.3.)
3. Remove the total counter with bracket [A] (1 screw, 1 connector).
4. Loosen the Allen screw [C] on the hinge.
5. Remove the hinge pin [B] (1 screw).
6. Remove the by-pass feed table [E] (1 screw, 1 connector).

6.2.10 BY-PASS FEED ROLLERS REPLACEMENT



A246R548.WMF



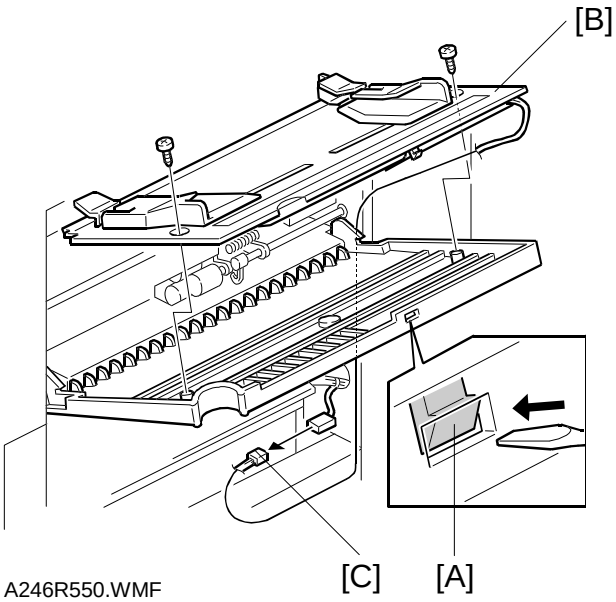
A246R549.WMF

1. Open the by-pass feed table then remove the cover [A] (3 screws).
2. Replace the pick-up roller [B] (1 snap ring) and the feed roller [C] (1 snap ring).

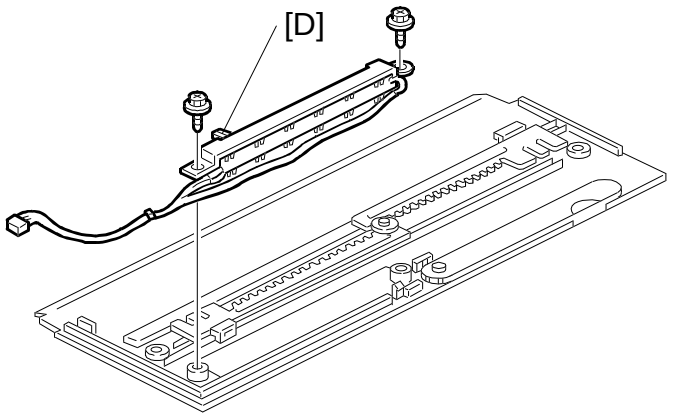
NOTE: The paper feed (pick-up, feed, separation) rollers used in the by-pass feed table and LCT are different from the paper feed rollers used in the 1st ~ 3rd feed units in the paper tray unit. They are not interchangeable.

3. Remove the feed unit cover. (Refer to Feed Unit Cover Removal, section 6.1.4.)
4. Replace the separation roller [D] (1 snap ring).

6.2.11 BY-PASS PAPER SIZE SENSOR REPLACEMENT

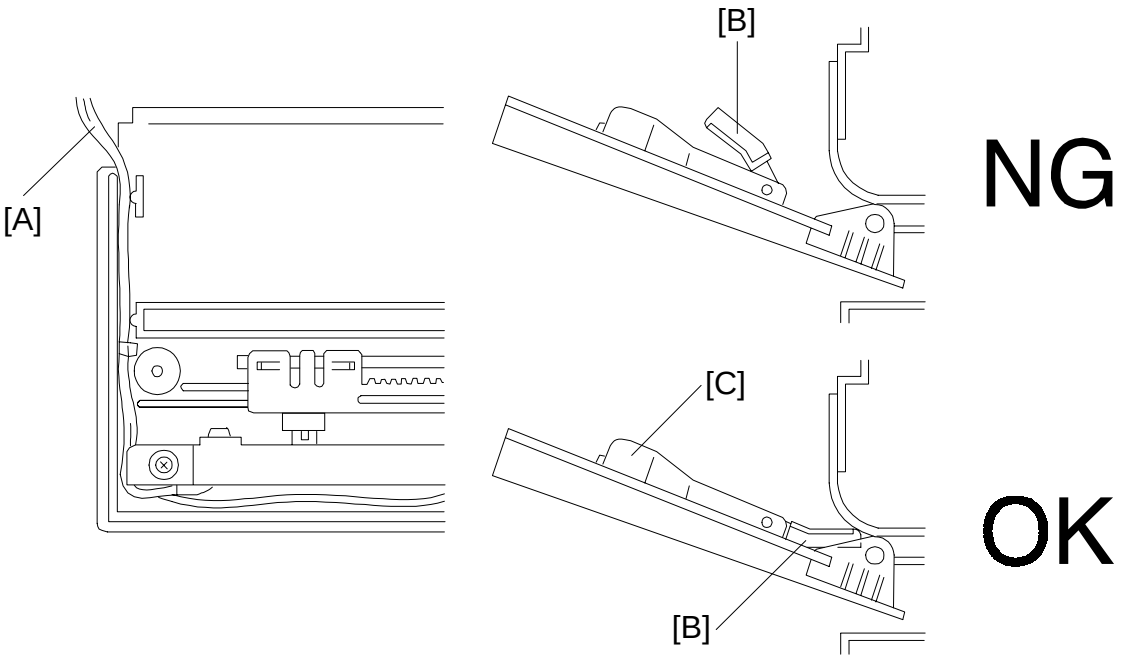


A246R550.WMF



A246R551.WMF

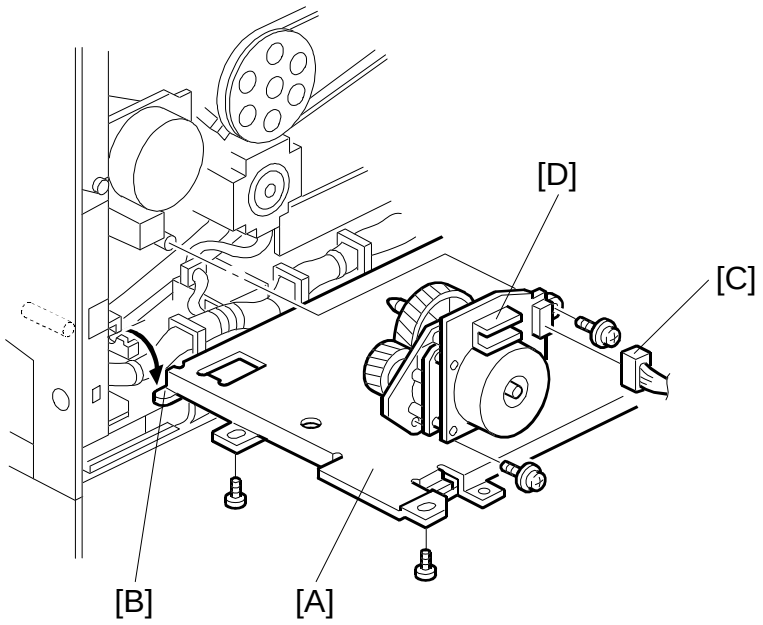
1. Turn off the main switch.
2. Open the by-pass table and remove the feed unit cover. (Refer to Feed Unit Cover Removal, section 6.1.4.)
3. While pushing the hook [A] with the head of the flat head screw driver as shown, remove the table assembly [B] (2 screws, 1 connector [C]).
4. Remove the by-pass paper size sensor [D] (2 screws).



A246R552.WMF

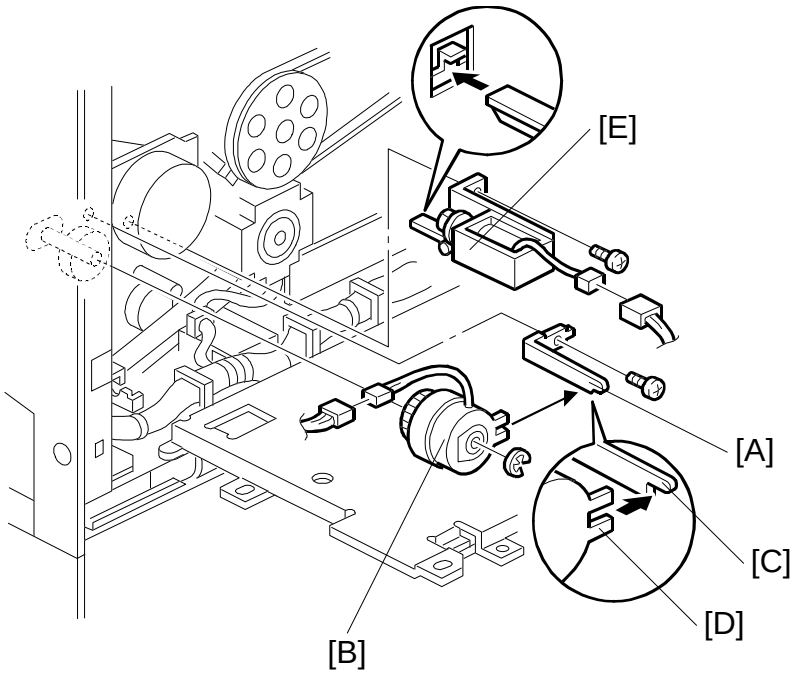
5. Re-install the by-pass paper size sensor then reassemble the by-pass feed table.
   NOTE: When installing the table assembly, be sure to route the wires [A] correctly as shown in the above diagram. The paper guides [B] must be in the lower position as shown.
6. Perform the by-pass feed sensor paper size correction (SP1-9-1) as follows:
   1) Enter SP mode (refer to Service Program Access Procedure) then access SP1-9-1.
   2) Place the side fence [C] at the A4 or 8 1/2 x 11 sideways position according to the paper size decal on the table.
   3) Place the side fence [C] at the A6 or 4 1/2 x 5 1/2 lengthwise position according to the paper size decal on the table.

6.2.12 BY-PASS FEED CLUTCH AND GUIDE PLATE SOLENOID REMOVAL



A246R553.WMF

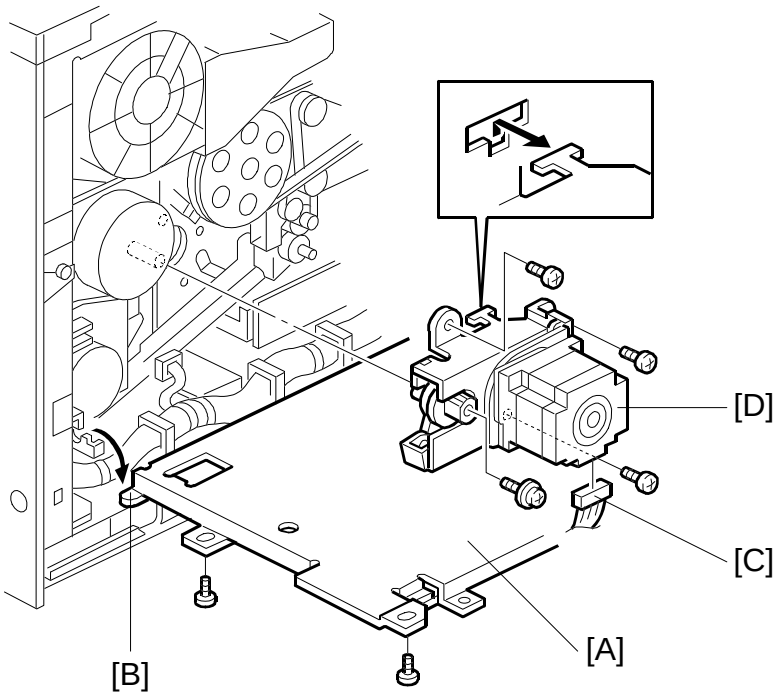
1. Turn off the main switch.
2. Remove the upper rear cover. (Refer to Upper Rear Cover Removal, section 6.1.2.)
3. Lower the main control board [A] (5 screws).
4. Unhook the main control board bracket hinge [B].
5. Disconnect the connector [C].
6. Remove the by-pass feed motor [D] (2 screws).



A246R555.WMF

7. Remove the clutch stopper [A] (1 screw).
   NOTE: When re-installing the by-pass feed clutch [B], set the clutch pin [C] in the cutout [D] of the stopper.
8. Remove the by-pass feed clutch (1 E-ring, 1 connector).
9. Remove the guide plate solenoid [E] (1 screw, 1 connector).

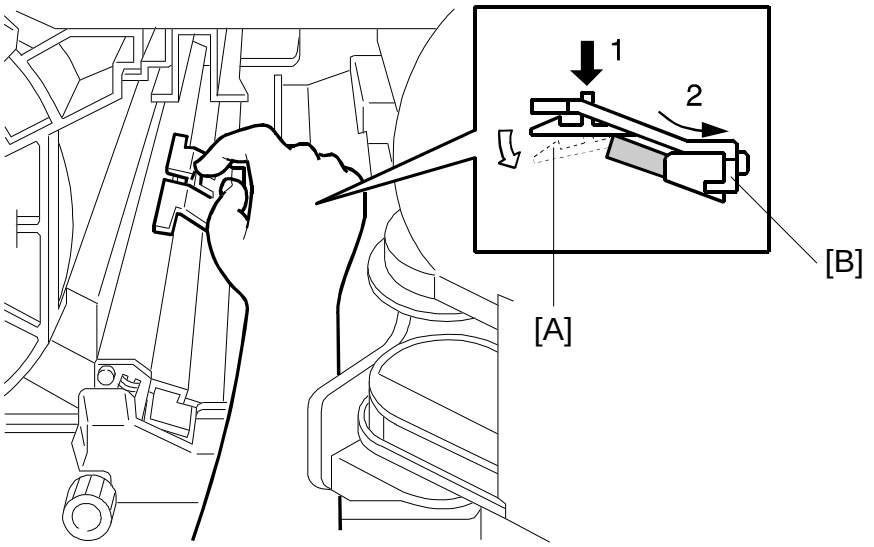
6.2.13 REGISTRATION MOTOR REMOVAL



A246R532.WMF

1. Remove the upper rear cover. (Refer to Upper Rear Cover Removal, section 6.1.2.)
2. Lower the main control board [A] (5 screws).
3. Unhook the main control board bracket hinge [B].
4. Disconnect the connector [C].
5. Remove the registration motor [D] (4 screws).

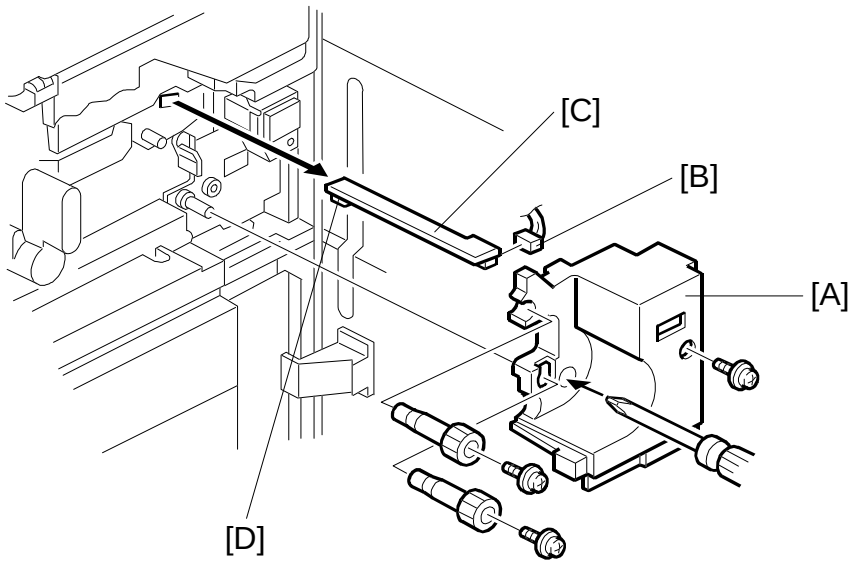
6.2.14 PAPER DUST CLEANER CLEANING



A246R556.WMF

1. Remove the development unit. (Refer to Development Unit Removal, section 6.5.1.)
2. While pushing down the hook lever [A], remove the paper dust cleaner [B].
3. Remove the paper dust inside the paper dust cleaner and clean the inside of the cleaner with a dry cloth or a blower-brush.

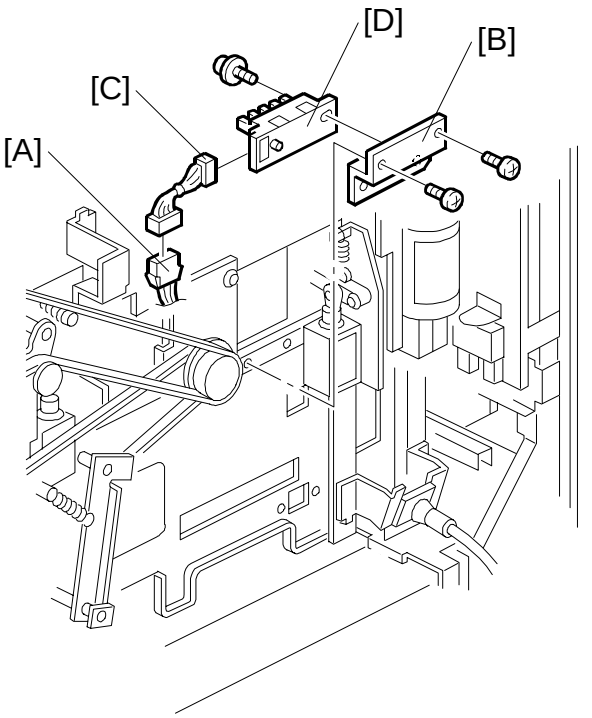
6.2.15 REGISTRATION SENSOR CLEANING



A246R557.WMF

1. Turn off the main switch.
2. Remove the right inner cover [A]. (Refer to Right Inner Cover Removal, section 6.1.3.)
3. Disconnect the connector [B].
4. Pull out the registration sensor assembly [C].
5. Clean the photo sensor [D] with a blower-brush.

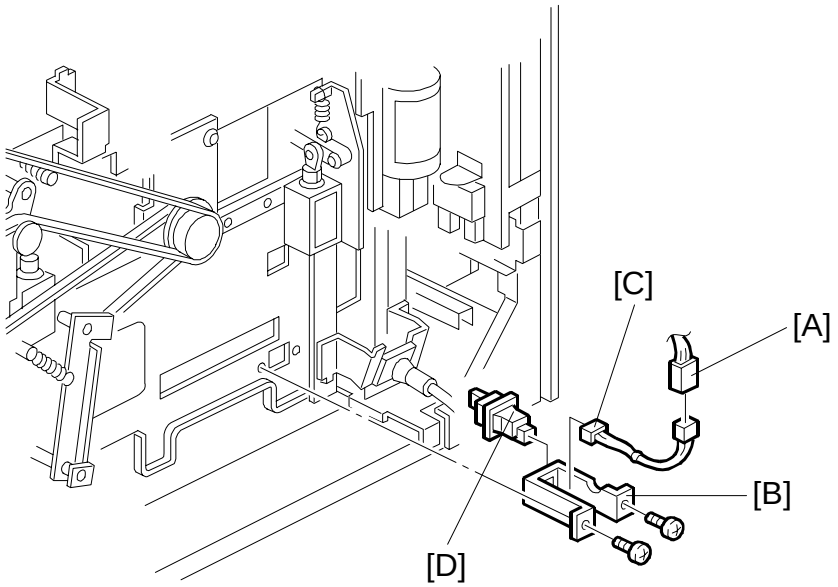
6.2.16 UNIVERSAL TRAY SIZE SWITCH REPLACEMENT



A246R527.WMF

1. Turn off the main switch.
2. Remove the lower rear cover. (Refer to Lower Rear Cover Removal, section 6.1.2.)
3. Remove the DC power supply unit (4 screws, all connectors).
4. Disconnect the connector [A].
5. Remove the tray size switch bracket [B] (2 screws).
6. Disconnect the connector [C].
7. Replace the universal tray size switch [D].

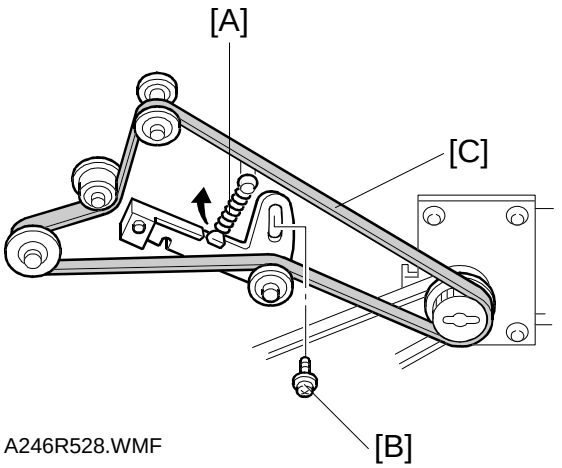
6.2.17 550-SHEET TRAY SET SWITCH REPLACEMENT



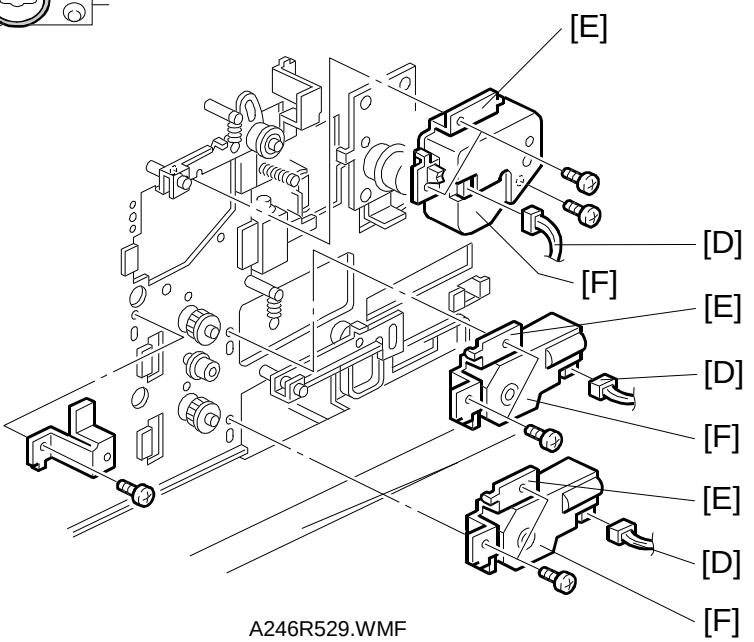
A246R527.WMF

1. Turn off the main switch.
2. Remove the lower rear cover. (Refer to Lower Rear Cover Removal, section 6.1.2.)
3. Remove the DC power supply unit (4 screws, all connectors).
4. Disconnect the connector [A].
5. Remove the tray set switch bracket [B] (2 screws).
6. Disconnect the connector [C].
7. Replace the 550-sheet tray set switch [D].

6.2.18 LIFT MOTOR REMOVAL



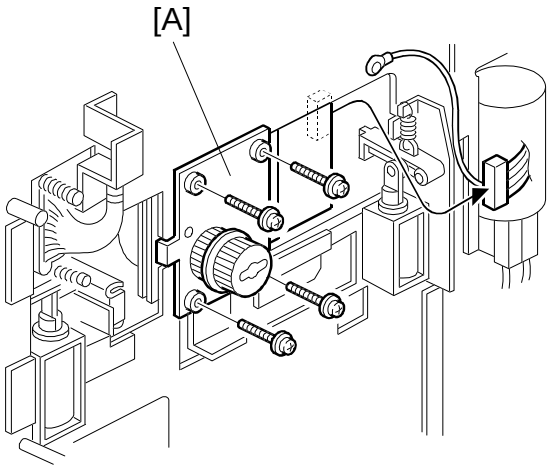
A246R528.WMF



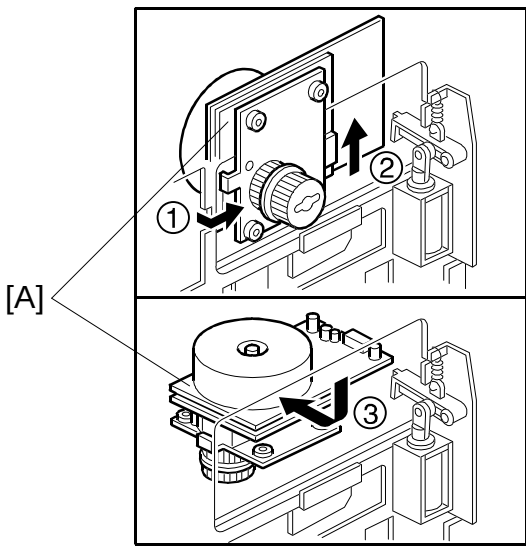
A246R529.WMF

1. Turn off the main switch.
2. Remove the lower rear cover. (Refer to Lower Rear Cover Removal, section 6.1.2.)
3. Remove the DC power supply unit (4 screws, all connectors).
4. Remove the tension spring [A].
5. Remove the screw [B].
6. Remove the upper timing belt [C].
7. Remove the tension spring (lower timing belt).
8. Remove the screw (lower timing belt).
9. Remove the lower timing belt.
10. Disconnect the connectors [D].
11. Remove the lift motor brackets [E] (2 screws each).
12. Remove the lift motors [F] (3 screws each).

6.2.19 PAPER FEED MOTOR REMOVAL



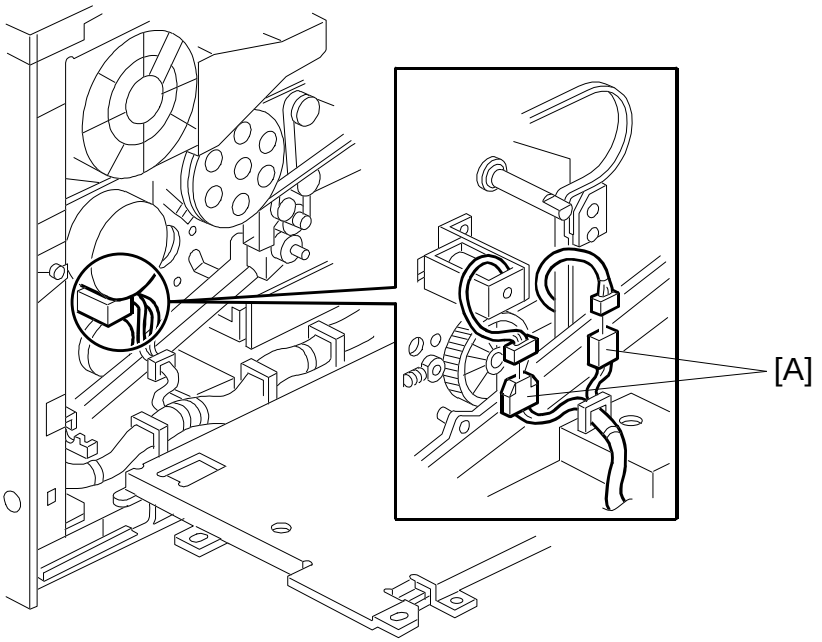
A246R530.WMF



A246R531.WMF

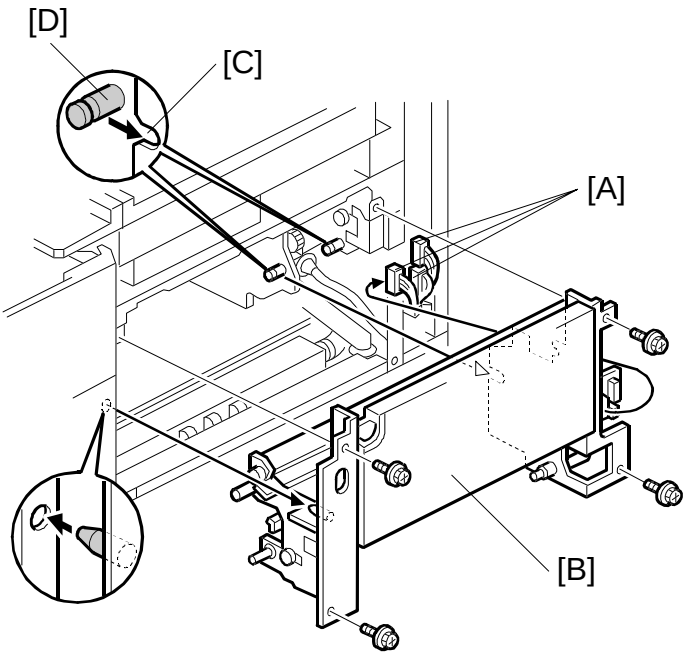
1. Perform steps 1 to 9 of Lift Motor Removal, section 6.2.18.
2. Remove the paper feed motor [A], as shown above.

6.2.20 COPIER FEED UNIT REMOVAL



A246R533.WMF

1. Turn off the main switch.
2. Remove the development unit. (Refer to Development Unit Removal, section 6.5.1.)
3. Remove the lower right inner cover. (Refer to Lower Right Inner Cover Removal, section 6.1.3.)
4. Draw out the duplex unit about 10 cm.
5. Remove the registration motor. (Refer to Registration Motor Removal, section 6.2.11.)
6. Remove the by-pass feed clutch. (Refer to By-pass Feed Clutch Removal, section 6.2.12.)
7. Disconnect the two connectors [A].

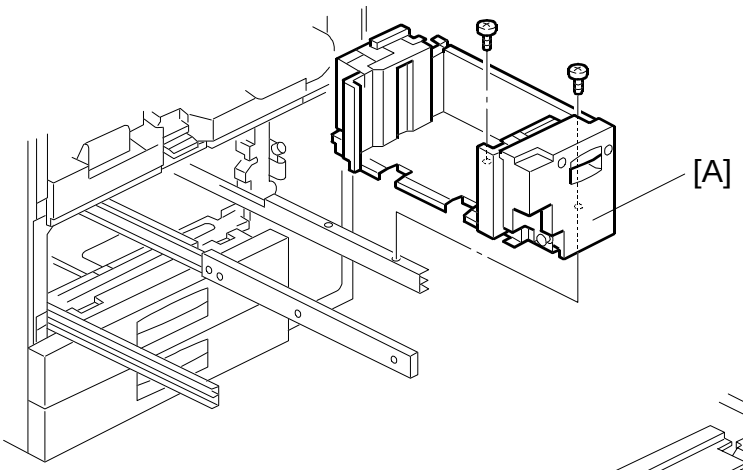


A246R534.WMF

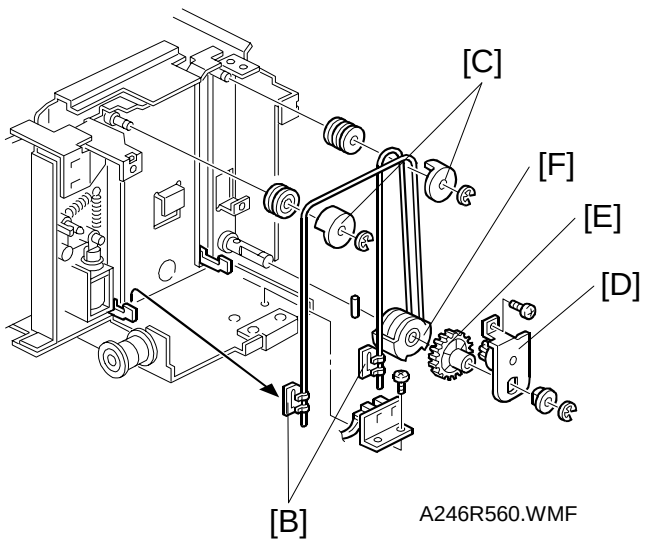
8. Disconnect the three connectors [A].
9. Remove the copier feed unit [B].
   NOTE: When the installing the copier feed unit in the copier:
   1) Do not pinch the harness.
   2) Keep the duplex unit drawn out.
   3) Fit the cut out [C] to the pin [D].

6.2.21 BOTTOM PLATE LIFT WIRE REPLACEMENT

NOTE: Before replacing the rear bottom plate lift wire, remove the front bottom plate lift wire. It is necessary to remove the shaft for replacing then the rear bottom plate lift wire.

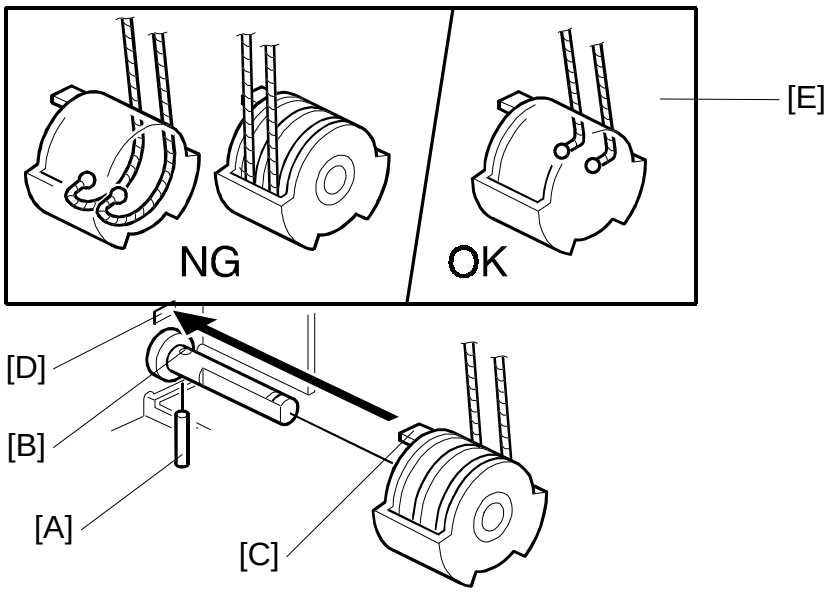


A246R559.WMF



A246R560.WMF

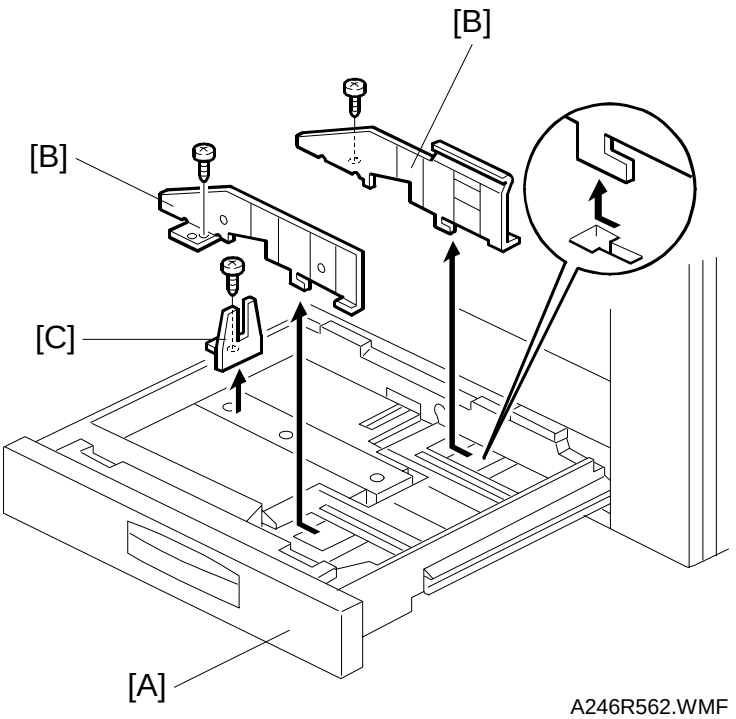
1. Remove the right tandem tray. (Refer to Paper Tray Removal, section 6.2.2.)
2. Remove the inner cover [A] (2 screws).
3. Slightly lift the front bottom plate and unhook the wire stoppers [B].
4. Remove the wire covers [C] (1 E-ring each).
5. Remove the bracket [D] (1 screw, 1 E-ring, 1 bushing).
6. Remove the gear [E].
7. Replace the bottom plate lift wire [F].



A246R561.WMF

NOTE: When re-installing the bottom plate lift wire:
1) Set the positioning pin [A] in the hole [B] and set the projection [C] in the hole [D].
2) Position the wire as shown [E].
3) Do not cross the wires.

6.2.22 550 SHEETS PAPER TRAY (TRAY 3)

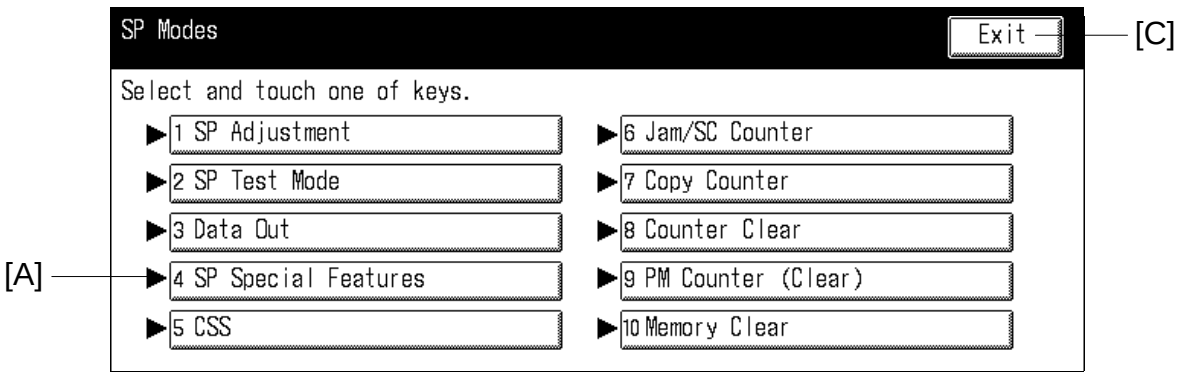


At the factory, the 3rd paper cassette is set for A3 or DLT. Change the paper size as follows.

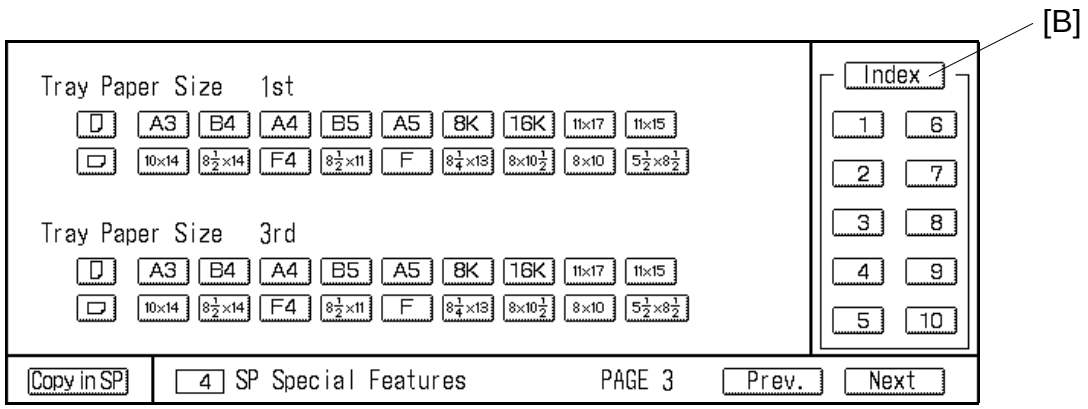
1. Draw out the paper feed tray [A].
2. Change the position of the front and the rear side fences [B] (2 screws each) and end fence [C] (one screw) according to the paper size.

3. Enter SP mode as follows:
   1) Press the mode clear key.
   2) Enter “107”.
   3) Press the clear/stop key more than 3 seconds.





A246I508.PCX

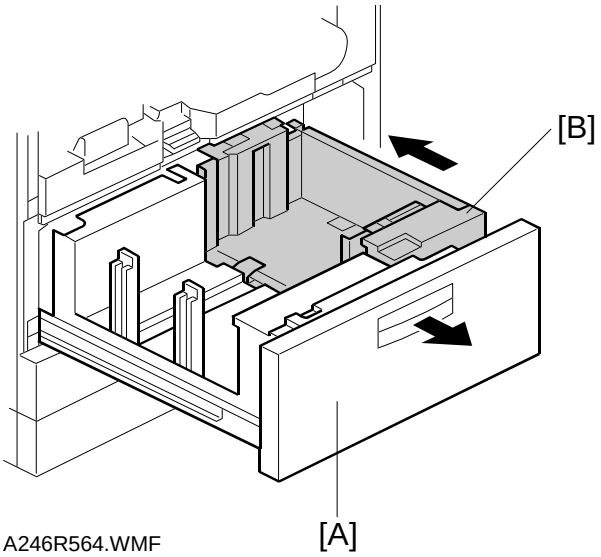


A246R703.PCX

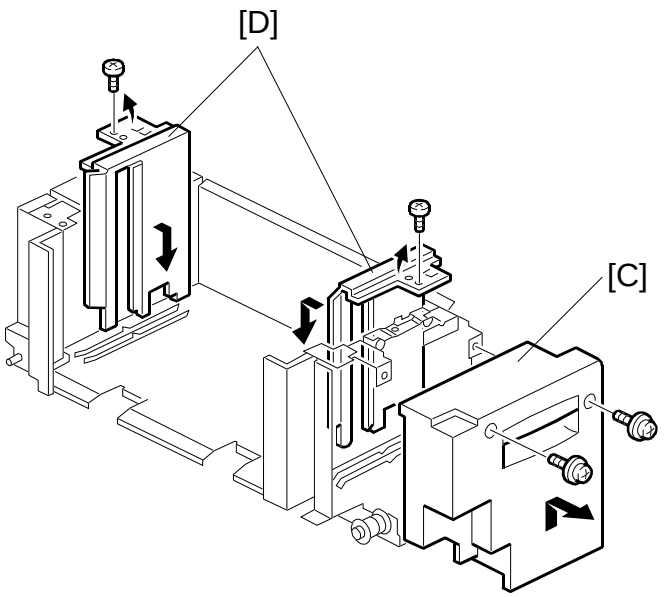
4. Touch the “SP Special Feature” key [A].
5. Enter SP4-3-2 (Tray Paper Size 3rd) then touch the paper size key of the 3rd feed station.
6. Touch the “Index” key [B].
7. Touch the “Exit” key [C] to exit SP mode.
8. Check copy quality and machine operation.

6.2.23 TANDEM FEED TRAY PAPER SIZE CHANGE

NOTE: At the factory, this tray is set up for A4 or LT sideways. Only A4 or LT sideways paper can be used for tandem feed.

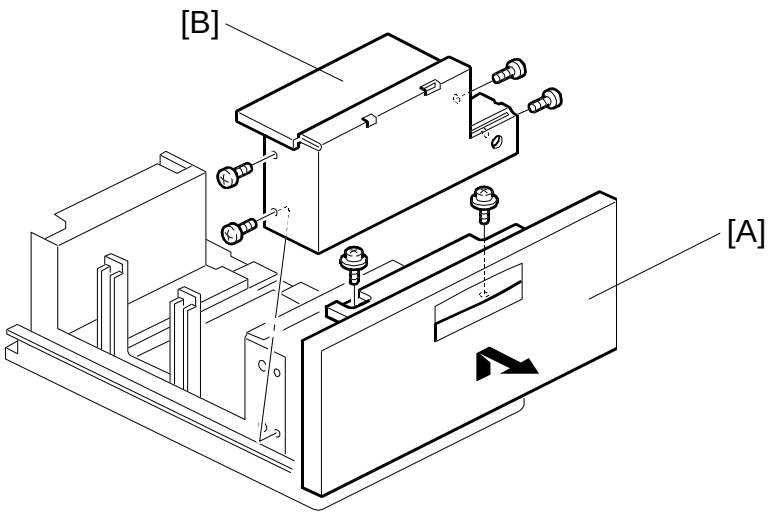


A246R564.WMF

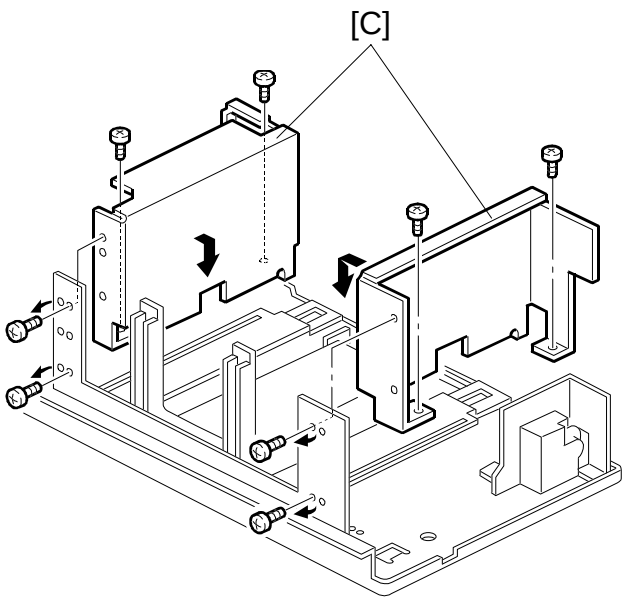


A246R565.WMF

1. Open the front cover.
2. Completely pull out the tandem feed tray [A] to separate right tandem tray [B] from the left tandem tray.
3. Remove the right tandem inner cover [C].
4. Re-position the side fences [D] (1 screw each). The outer slot position is used when loading A4 size paper.
5. Re-install the right tandem inner cover [C].

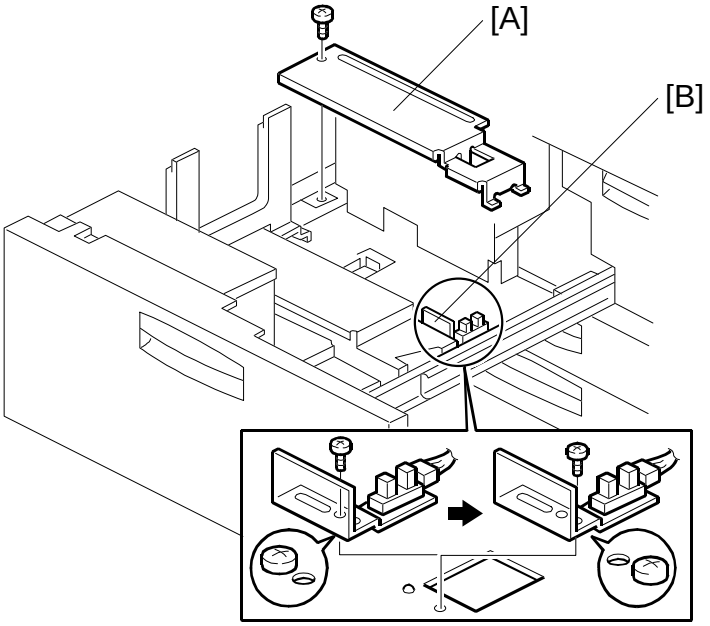


A246R566.WMF



A246I523.WMF

6. Remove the tray cover [A] (2 screws).
7. Remove the DC motor cover [B] (4 screws).
8. Re-position the side fences [C] (4 screws each). The outer slot position is used when loading A4 size paper.
9. Re-install the DC motor cover and the tray cover.

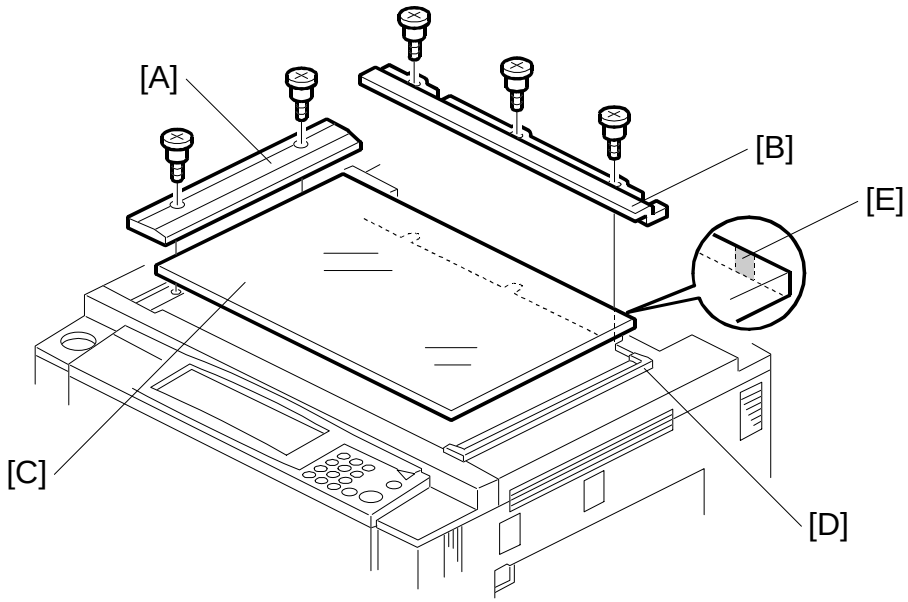


A246I524.WMF

10. Remove the rear bottom plate [A] (1 screw).
11. Re-position the return position sensor bracket [B] (1 screw). To use the paper tray for A4 size, set the screw on the left hole as shown. (For LT size, the screw should be placed on the right.)
12. Re-install the rear bottom plate.
13. Perform steps 3 to 8 from the “550 Sheet Paper Tray Size Change” procedure.

6.3 OPTICS

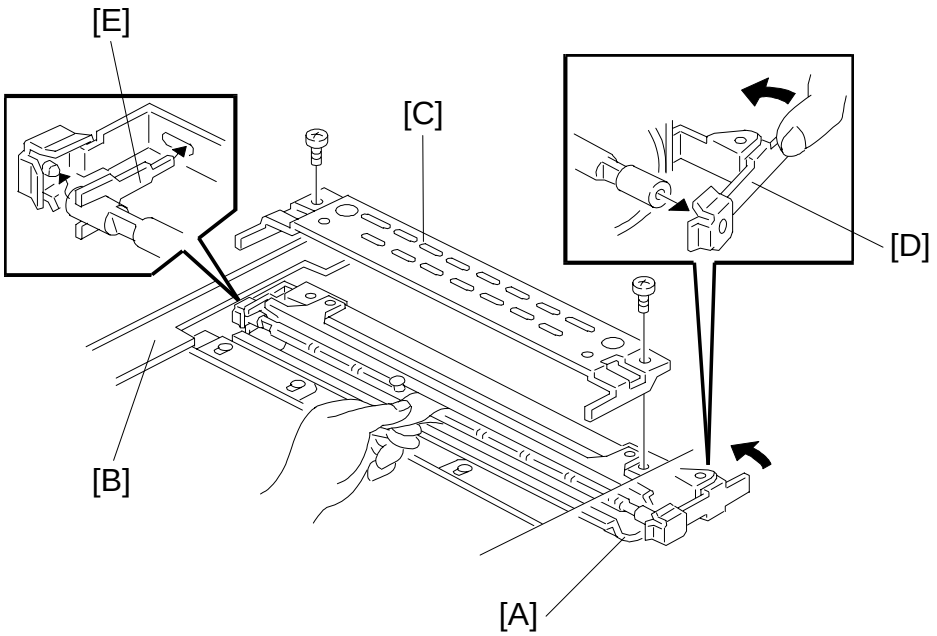
6.3.1 EXPOSURE GLASS REMOVAL



A246R568.WMF

1. Turn off the main switch.
2. Remove the left scale [A] (2 shoulder screws).
3. Remove the rear scale [B] (3 screws).
4. Grasp the left edge of the exposure glass [C] and lift slightly. Slide the other edge out from under the right glass holder [D]. Remove the exposure glass.
   NOTE: When re-installing the exposure glass:
   1) Make sure that the mark [E] on the edge of the glass is located at the rear right corner. This side is smoother and it generates less static electricity when the ARDF is used.
   2) Set it to right fully.

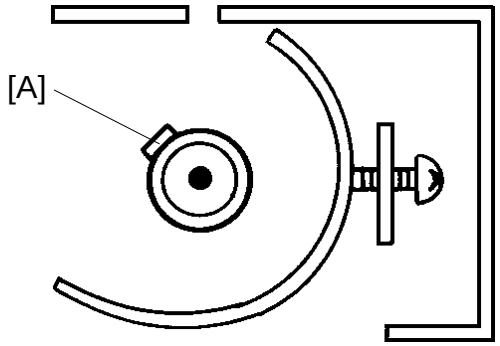
6.3.2 EXPOSURE LAMP REPLACEMENT



A246R569.WMF

NOTE: Do not touch the reflector or the new exposure lamp with your bare hands. Use a strip of paper as shown. (Oil marks from fingers on the lamp or reflectors will be affected by heat from the lamp.)

1. Remove the exposure glass. (Refer to Exposure Glass Removal, section 6.3.1)
2. Move the first scanner [A] to the cutout position at the rear frame [B]. (See illustration.)
3. Remove the reflector cover [C] (2 screws).
4. While holding the lamp with a paper strip, release the lamp terminal [D] as shown; then, take out the lamp.
5. Install a new lamp. Use a strip of paper to hold the lamp. Confirm that the lamp is properly set by both terminals and that the clip [E] is set properly.

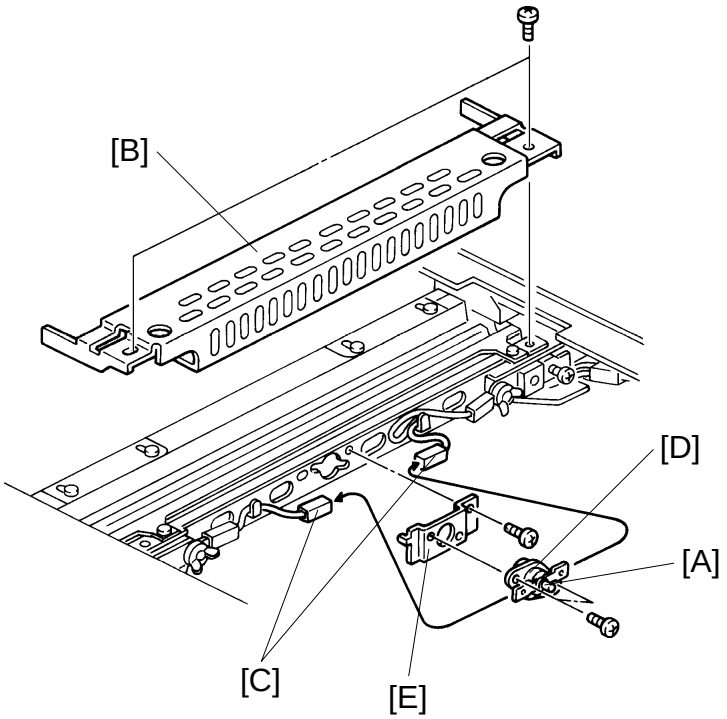


A246R570.PCX

NOTE: Make sure that the blister [A] on the lamp points towards the reflector opening (left side of the copier) as shown.

6. Reassemble the copier.
7. Turn on the main switch and enter SP mode, then perform the Process Control Initial Setting (SP1-2-2).

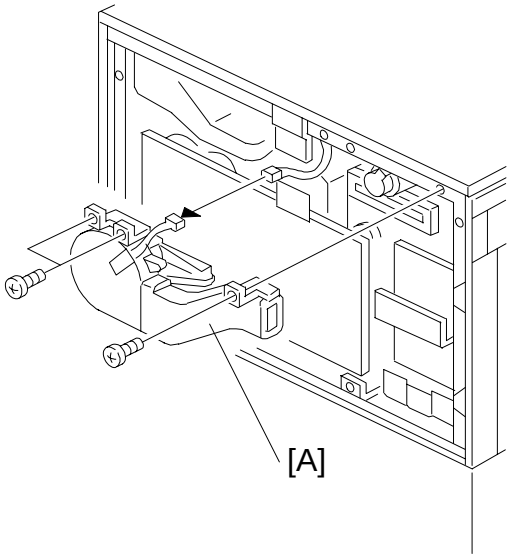
6.3.3 OPTICS THERMOSWITCH REPLACEMENT



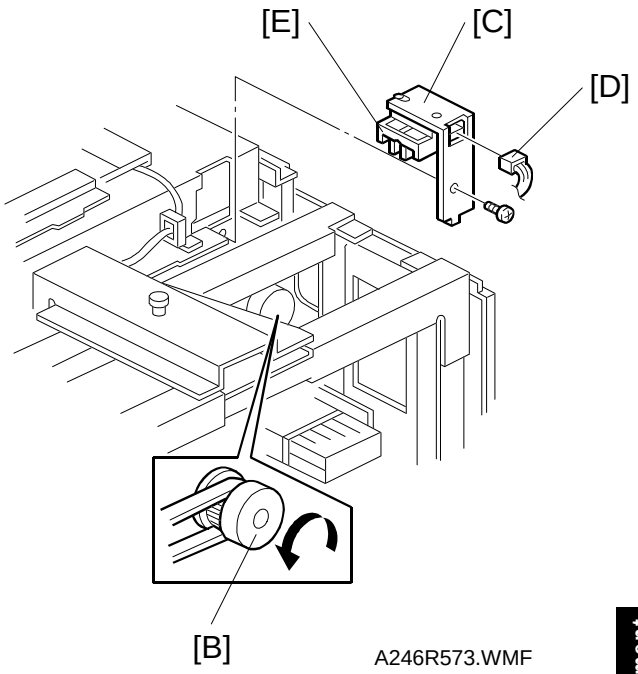
NOTE: The thermoswitch can be reset manually by pushing the red button [A] when the exposure lamp area cools.

1. Remove the exposure glass. (Refer to Exposure Glass Removal, section 6.3.1.)
2. Move the first scanner to the cutout position at the rear frame.
3. Remove the reflector cover [B] (2 screws).
4. Remove the exposure lamp leads [C] from the terminals on both sides of the thermoswitch [D].
5. Remove the thermoswitch bracket [E] (1 screw).
6. Remove the thermoswitch from the bracket (2 screws), and replace it.

6.3.4 SCANNER HP SENSOR REPLACEMENT



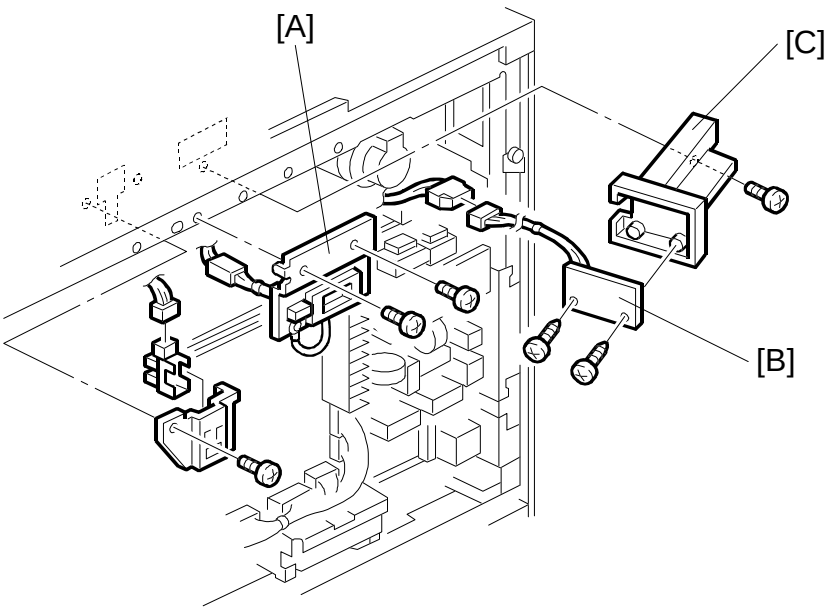
A246R572.WMF



A246R573.WMF

1. Remove the upper rear cover. (Refer to Upper Rear Cover Removal, section 6.1.2.)
2. Remove the exhaust fan [A] (3 screws, 1 connector).
3. Remove the upper cover. (Refer to Upper Cover Removal, section 6.1.7.)
4. Manually turn the scanner drive pulley [B] counterclockwise to move the scanners about 10 mm to the left (rear view).
5. Remove the scanner HP sensor bracket [C] (1 screw).
6. Disconnect the connector [D].
7. Replace the scanner HP sensor [E] (1 screw).

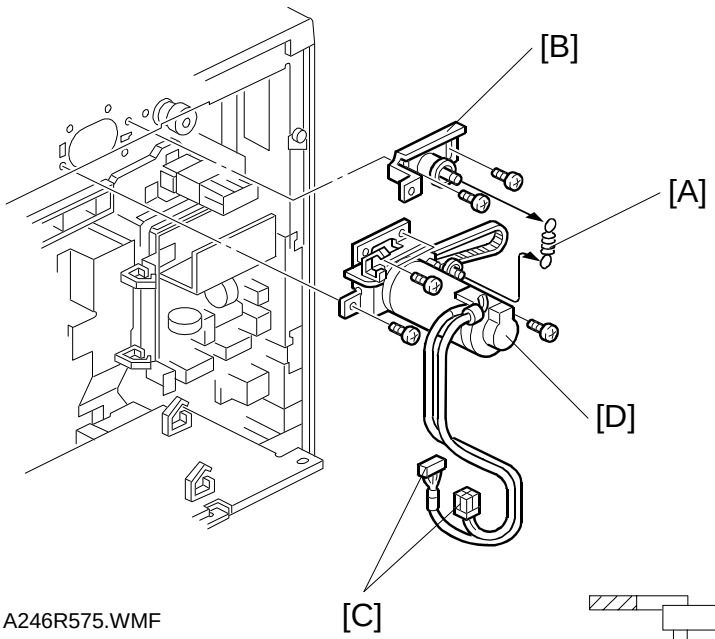
6.3.5 ADS SENSOR REMOVAL



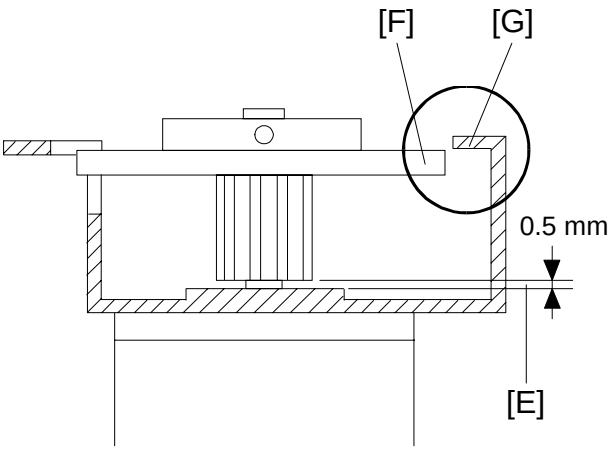
A246R574.WMF

1. Remove the exhaust fan. (Refer to Scanner HP Sensor Replacement, section 6.3.4.)
2. Remove the ARDF connector bracket [A] (2 screws).
3. Remove the ADS sensor [B] with the cover [C] (1 screw).
4. Replace the ADS sensor (2 screws).
5. Re-assemble the copier.
6. Turn on the main switch and enter SP mode, then perform the Auto ADS Initial Setting (SP1-15-4).

6.3.6 SCANNER DRIVE MOTOR



A246R575.WMF

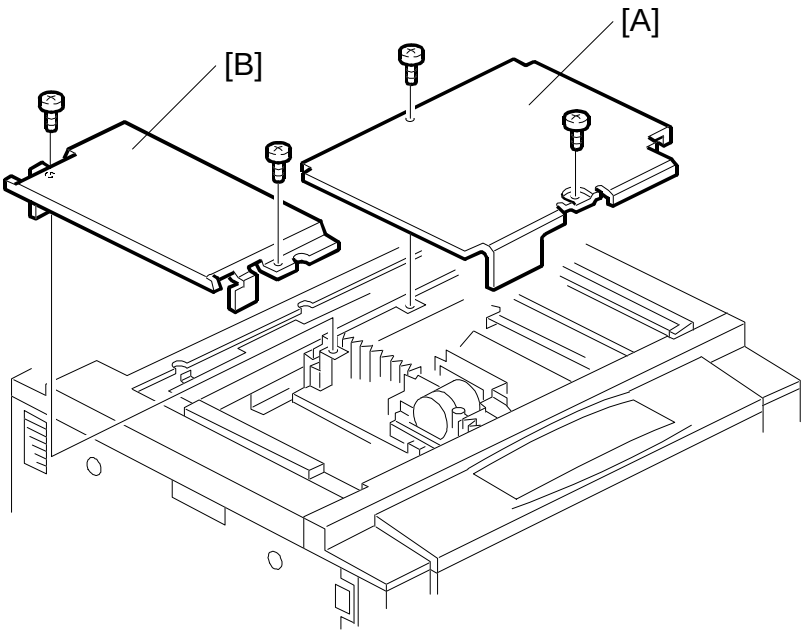


A246R575.WMF

1. Remove the exhaust fan. (Refer to Scanner HP Sensor Replacement, section 6.3.4.)
2. Remove the tension spring [A].
3. Remove the tension tightener [B] (2 screws).
4. Disconnect the two connectors [C] from the Optic Control Board.
5. Remove the scanner motor [D] (4 screws).
   NOTE: While replacing the drive pulley, the gap [E] should be 0.5 mm so that the upper edge [F] of the pulley is lower than the upper surface [G] of the bracket, as shown above.

6.3.7 SCANNER DRIVE WIRES REPLACEMENT

Removal

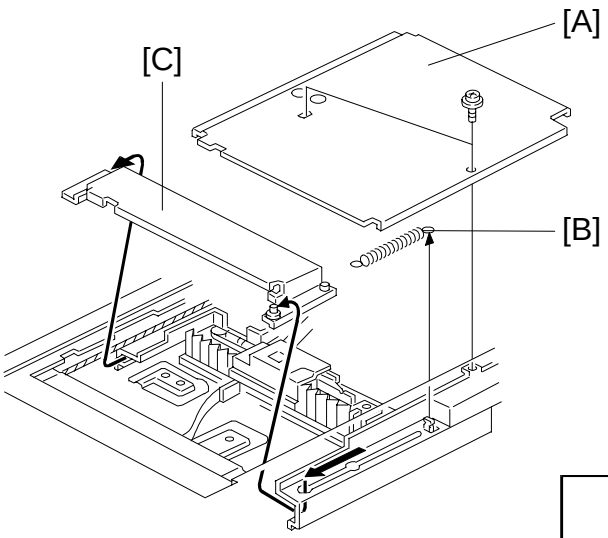


A246R636.WMF

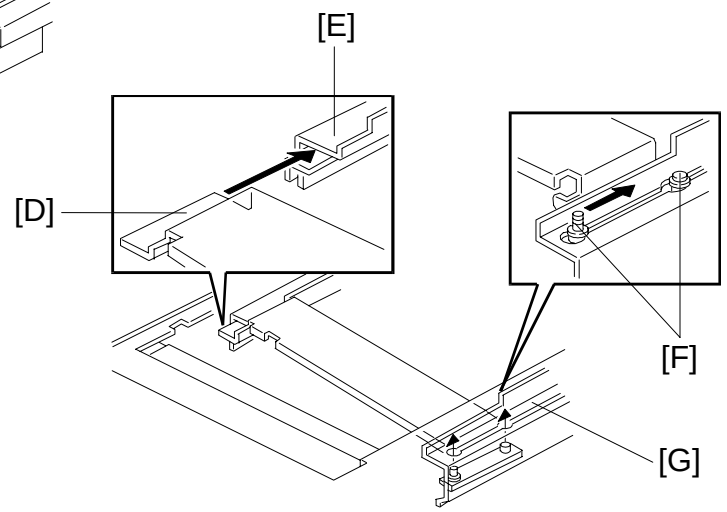
1. Remove the exposure glass. (Refer to Exposure Glass Removal, section 6.3.1.)
2. Remove the scanner drive motor. (Refer to Scanner Drive Motor Removal, section 6.3.6.)

- Step 3 through 4 for EU and Asia copiers -

3. Remove the lens unit cover [A] (2 screws).
4. Remove the light shielding plate [B] (2 screws).



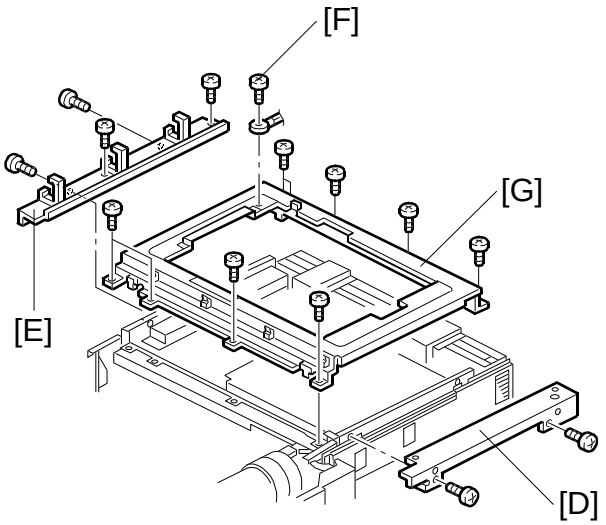
A246R706.WMF



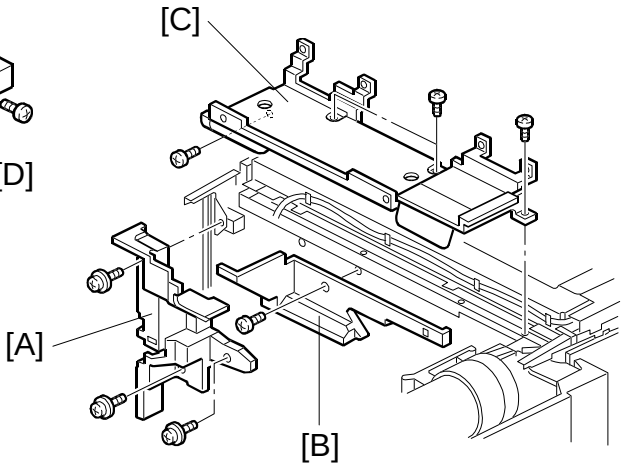
A246R707.WMF

- Step 5 through 7 for NA copiers -

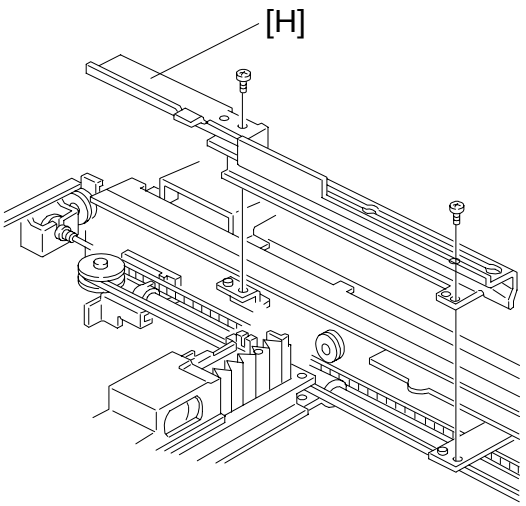
5. Remove the lens unit cover [A] (2 screws).
6. Unhook the tension spring [B].
7. Remove the lens shield plate [C].
   NOTE: When re-installing the lens shield plate, set the rear part [D] of the lens shield plate between the guides [E], as shown. Then set the grooves on the guide pins [F] in the rail [G]. After re-installing the tension spring, confirm that movement of the lens shield plate is smooth.
8. Remove the upper cover. (Refer to Upper Cover Removal, section 6.1.2.)



A246R638.WMF



A246R637.WMF

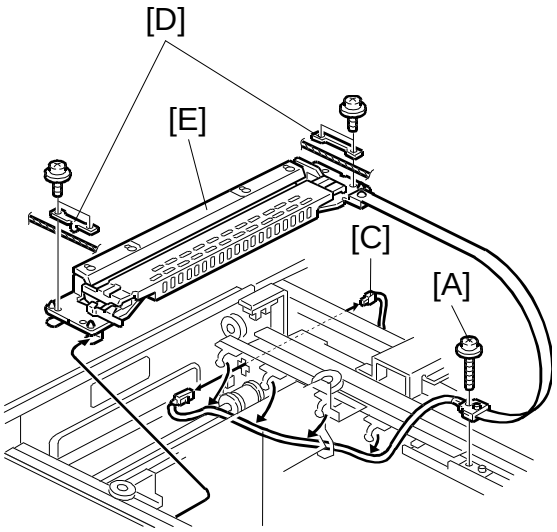


A246R708.WMF

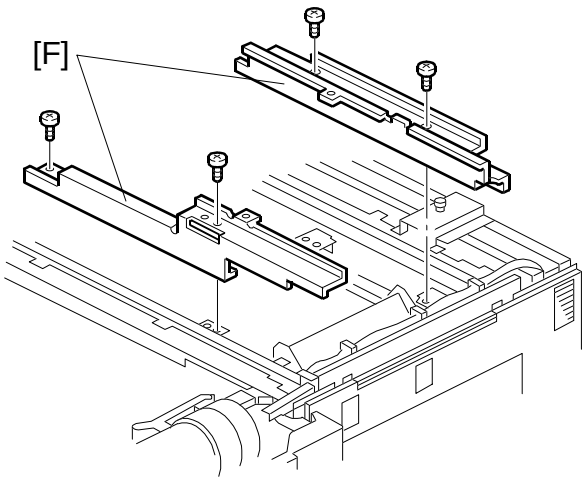
9. Remove the left and upper inner covers [A, B]. (Refer to Inner Cover Removal, section 6.1.3.)
10. Remove the operation panel bracket [C] (4 screws).
11. Remove the harness cover bracket [D] (2 screws).
12. Remove the harness guide bracket [E] (4 screws).
13. Remove the screw [F] securing the grounding wire.
14. Unhook the harness from the four harness clamps on the upper optics frame [G].
15. Remove the upper optics frame [G] (9 screws).

- Step 16 for NA copiers -

16. Remove the front bracket [H] (2 screws).



A246R639.WMF

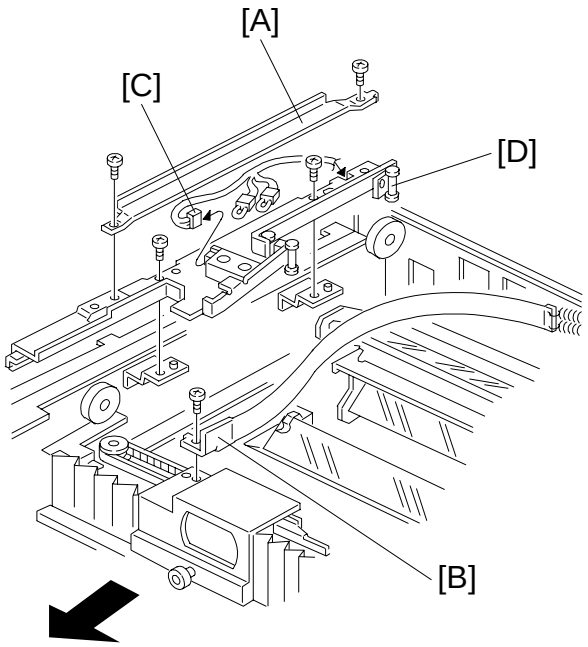


A246R640.WMF

17. Remove the screw [A] securing the scanner flat cable.
18. Unhook the four harness [B] clamps shown above.
19. Disconnect the connector [C] outside the optic side frame.
20. Remove the scanner clamps [D] securing both sides of the first scanner unit to the scanner wires (2 screws each).
21. Remove the first scanner [E].
22. Move the lens unit to the left.

- Step 23 for EU and Asia copiers -

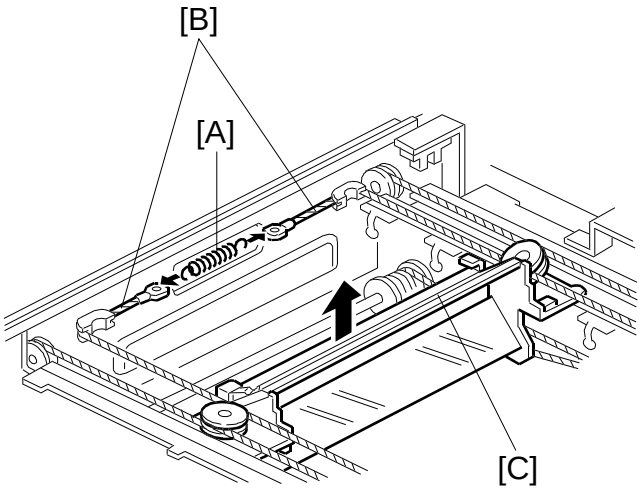
23. Remove the scanner rails [F] (2 screws each).



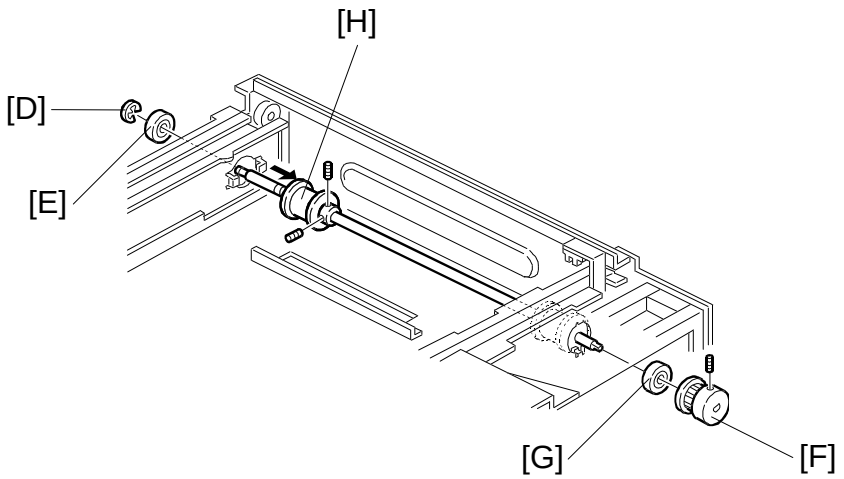
A246R709.WMF

- Step 24 through 26 for NA copiers -

24. Remove the harness cover [A] (2 screws).
25. Remove the light shield mylar bracket [B] (1 screw).
26. Disconnect the paper length size sensor connector [C] and move the lens unit to the left, then remove the rear bracket [D] (2 screws).



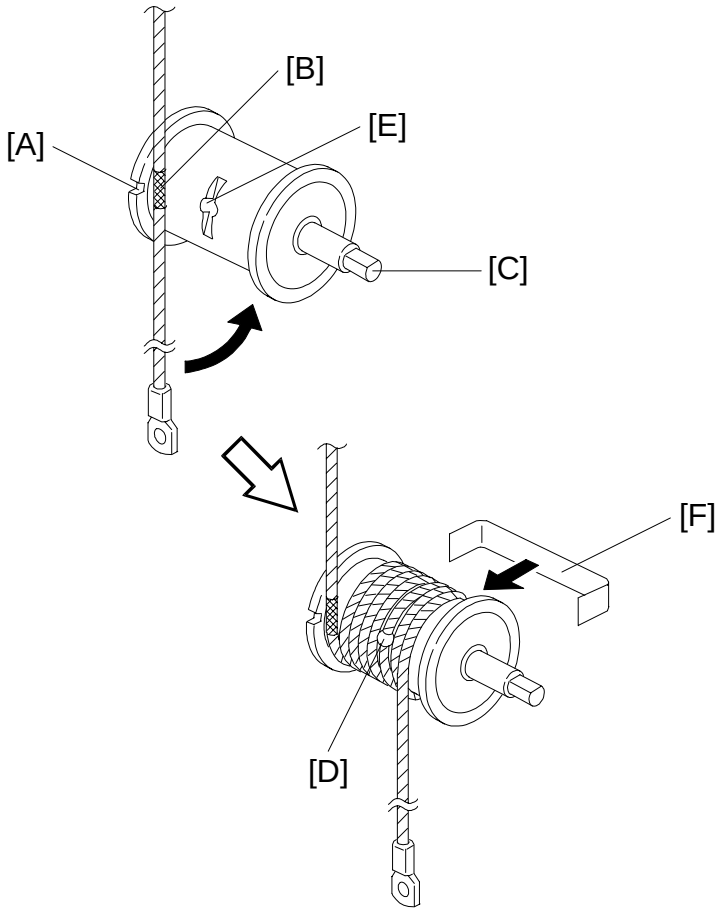
A246R641.WMF



A246R642.WMF

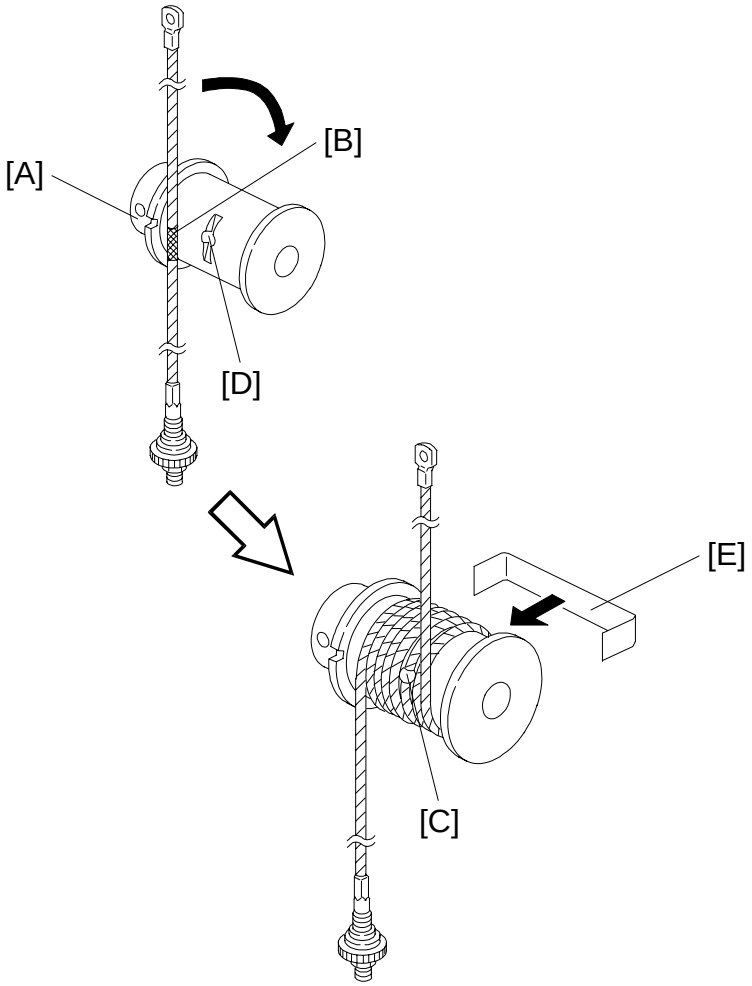
27. Unhook the tension spring [A] and remove the scanner wires [B].
28. Remove the second scanner [C].
29. Remove the scanner drive shaft E-ring [D] and the front ball bearing [E].
30. Remove the rear drive pulley [F] (1 Allen screw) and the rear ball rearing [G].
31. Loosen the two Allen screws of the front drive pulley [H] and slide the pulley about 10 cm to the rear, then take out the drive shaft.

Installation



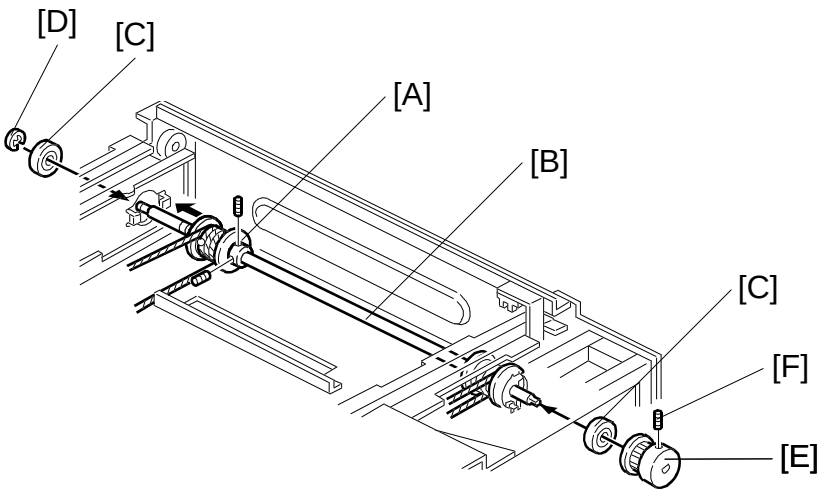
A246R577.WMF

1. Wind the rear scanner drive wire on the rear pulley as follows:
   1) Align the cut out [A] on the edge of the rear drive pulley and the blue mark [B] on the wire as illustration above.
   2) Wind the wire counter-clockwise 5 times as shown in the illustration, the D-cut [C] on the shaft is at the front side, then set the bead [D] on the wire in the hole [E] on the pulley. Here, the bead just reaches the hole on the pulley.
   3) After setting the bead in the hole, wind the wire two more times (in total 7 times).
   4) Fix the wire with tape [F] as shown.

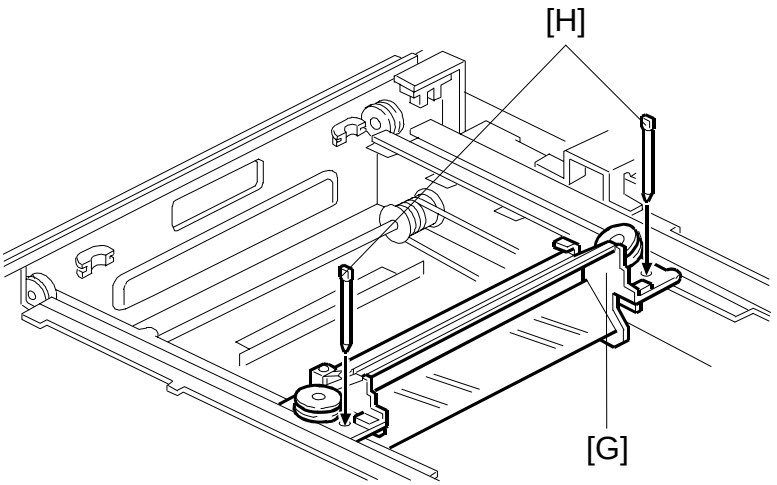


A246R578.WMF

2. Wind the front scanner drive wire on the front pulley as shown:
   1) Align the cut out [A] on the edge of the front drive pulley and the red mark [B] on the wire.
   2) Wind the wire clockwise 5 times as shown (in the illustration, the Allen screw holes are at the rear side) then set the bead [C] on the wire in the hole [D] on the pulley. Here, the bead just reaches to the hole on the pulley.
   3) After setting the bead in the hole, wind the wire twice more (in total 7 times).
   4) Fix the wire with tape [E] as shown.

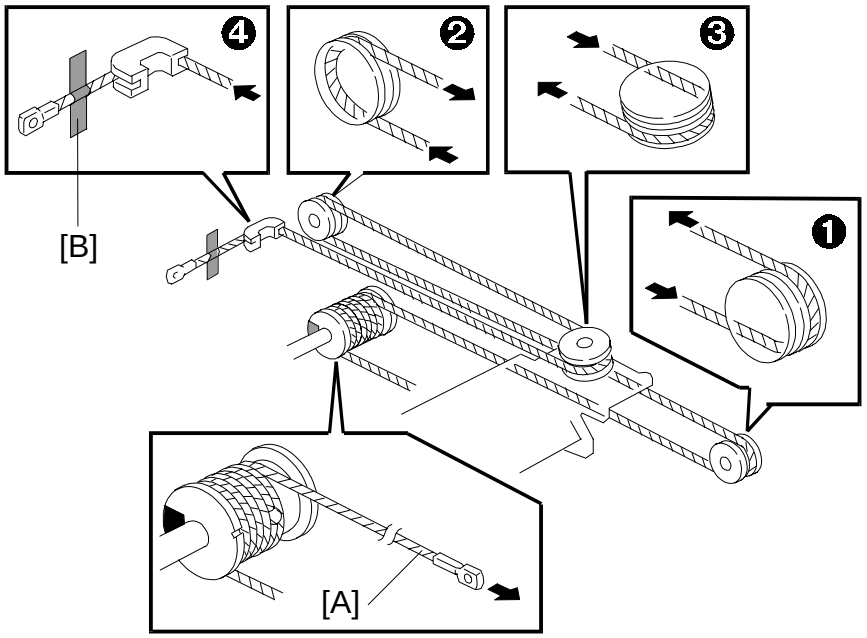


A246R579.WMF



A246R704.WMF

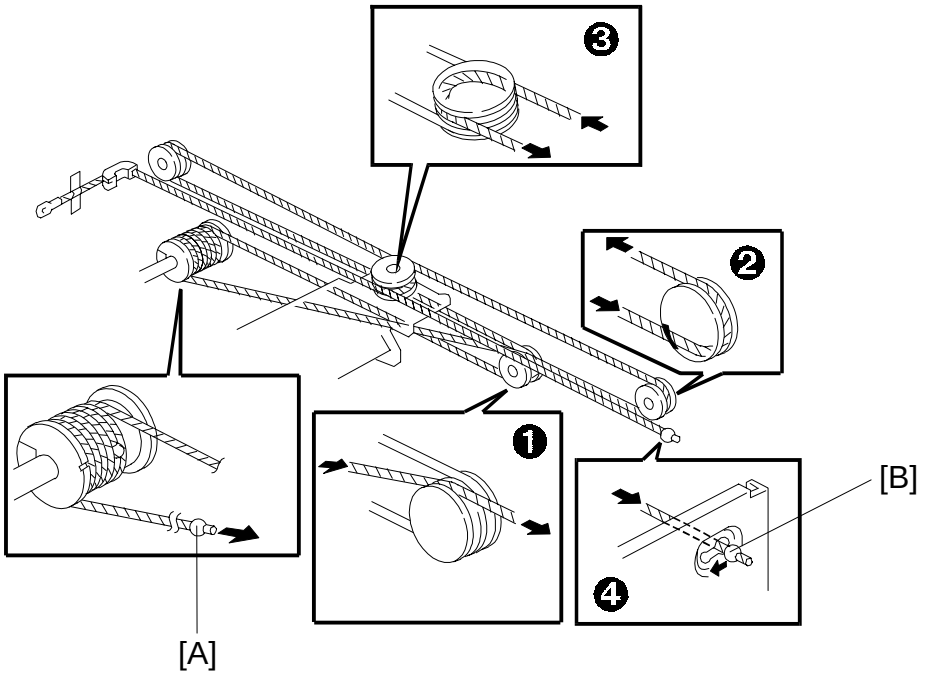
3. Set the front drive pulley [A] on the drive shaft. (Leave the Allen screws loosened.)
4. Place the scanner drive shaft [B] in the holes on the optics front and rear side frames.
5. Set ball bearings [C] on both sides of the scanner drive shaft.
6. Set the E-ring [D] on the front end of the scanner drive shaft.
7. Set and fully push in the scanner drive pulley [E] on the end of the scanner drive shaft, then tighten the Allen screw [F].
8. Install the scanner drive motor. (Refer to Scanner Drive Motor Replacement, section 6.3.6.)
9. Place the second scanner [G] on the guide rail and fix it there by using two jig pins [H].
   NOTE: This jig pins are not used on the copier, so it is necessary to prepare them.



A246R581.WMF

10. Route the shorter end [A] of the rear scanner drive wire in the following order:

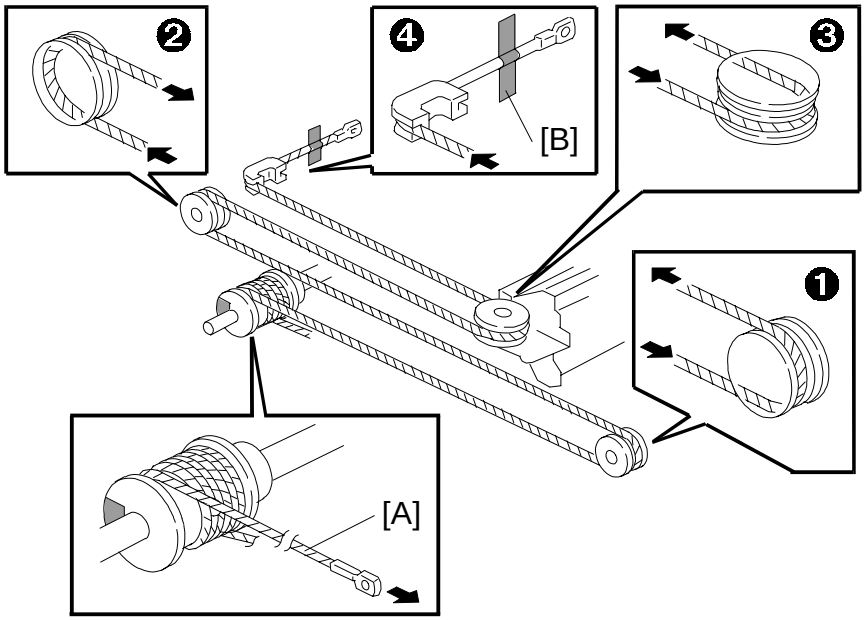
❶ Rear track counter-clockwise.
❷ Clockwise.
❸ Lower track clockwise.
❹ Fix the end of the wire on the frame with tape [B].



A246R582.WMF

11. Route the longer end [A] of the rear scanner drive wire in the following order:

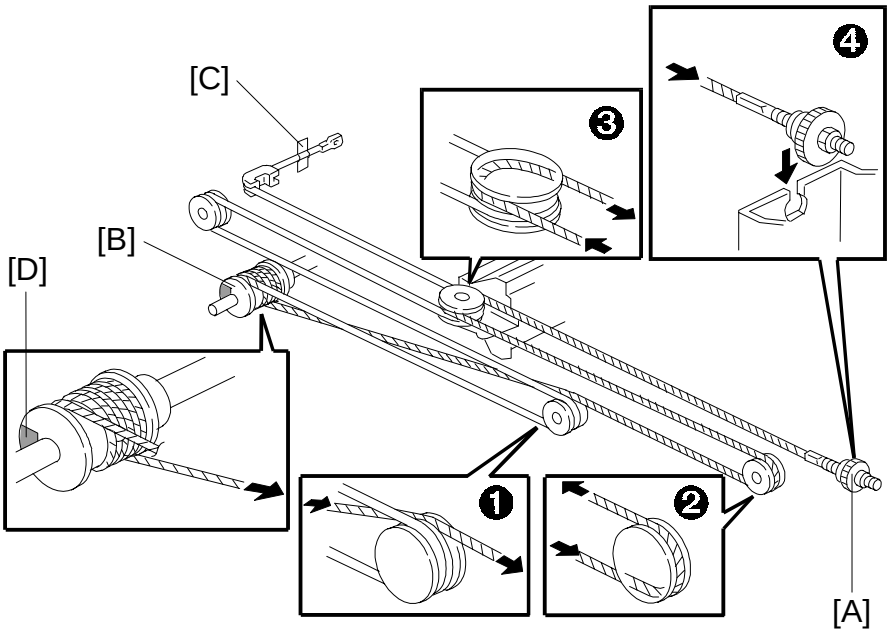
❶ Through the front track, upper side.
❷ Counter-clockwise.
❸ Upper track counter-clockwise.
❹ Hook the end [B] of the wire on the cutout on the right optics side frame.



A246R583.WMF

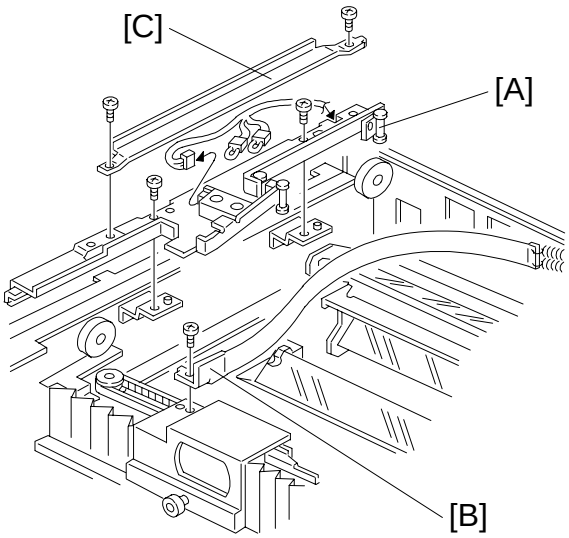
12. Route the shorter end [A] of the front scanner drive wire in the following order:

❶ Front track counter-clockwise.
❷ Clockwise.
❸ Lower track counter-clockwise.
❹ Fix the end of the wire on the frame with tape [B].

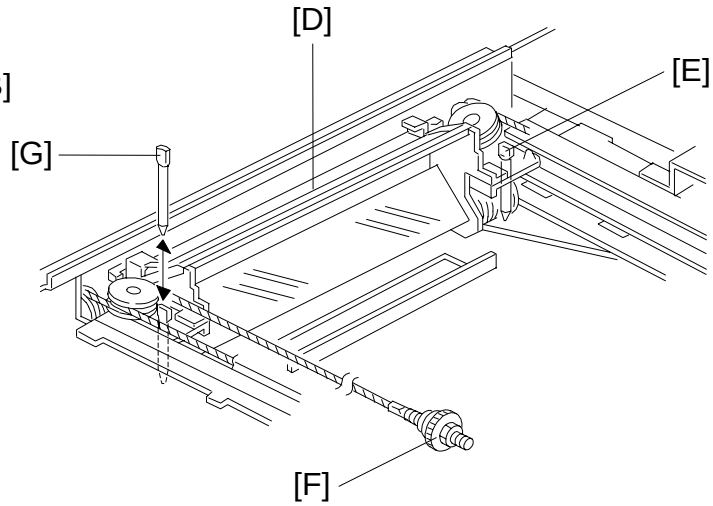


A246R584.WMF

13. Route the longer end [A] of the front scanner drive wire in the following order:
    - ❶ Through the rear track, upper side.
    - ❷ Counter-clockwise.
    - ❸ Upper track clockwise.
    - ❹ Hook the end [A] of the wire on the cut out on the right optics side frame.
14. Slightly push the front drive pulley [B] against the front optics side frame and tighten the two Allen screws.
15. Remove the jig pins securing the second scanner.
16. Remove the tapes [C] securing the ends of the scanner drive wires and hook the ends of the scanner drive wires with the tension spring.
17. Remove the tapes [D] securing the wire to the front and rear drive pulleys.



A246R710.WMF



A246R585.WMF

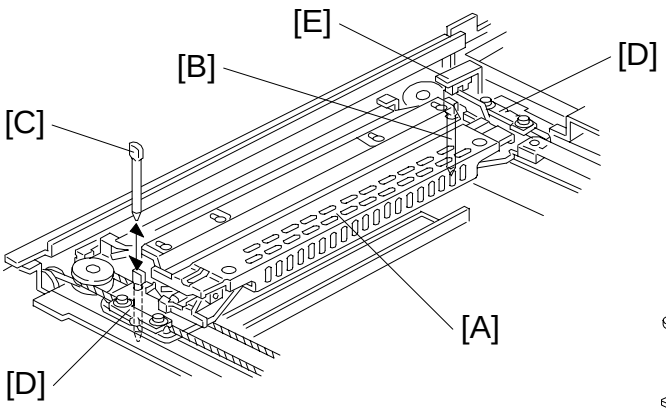
- Step 18 for NA copiers -

18. Install the bracket [A] (2 screws, 1 connector), shielding mylar bracket [B] (1 screw) and harness cover [C] (2 screws).

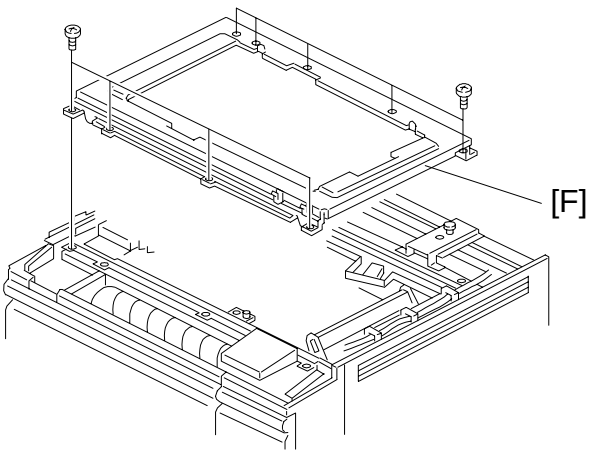
19. Adjust the second scanner alignment as follows:

- Second Scanner Alignment -

1) Move the second scanner [D] to the left end position. Fix the rear side of the second scanner by inserting the jig pin [E] in the holes on the rear side of the second scanner and the rear guide rail.
2) Turn the adjusting nut [F] to adjust the second scanner alignment so that the jig pins [E, G] can be smoothly set in the holes on the front side of the second scanner and the front guide rail.



A246R586.WMF



A246R587.WMF

20. Place the first scanner unit on the guide rail then adjust the first scanner alignment as follows:

- First Scanner Alignment -

1) Move the first scanner [A] to the left end position. Fix the rear end of the first scanner by inserting the jig pin [B] in the holes on the first scanner and the guide rail.
2) Position the first scanner so that the jig pins [B, C] can be smoothly set in the holes on the first scanner and the guide rail, then tighten the wire clamp brackets [D] (2 screws each).

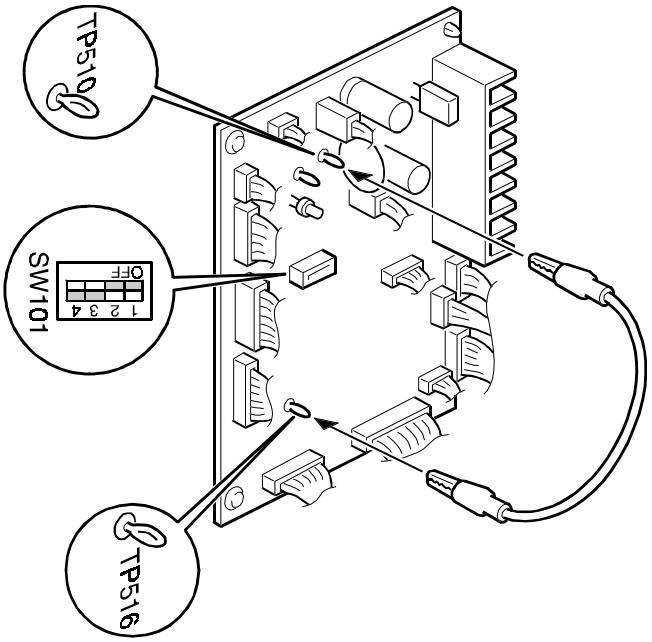
- Step 21 for EU and Asia copiers -

21. Install the scanner rails.

- Step 22 for NA copiers -

22. Install the front bracket.

23. Secure the scanner flat cable (1 screw).
24. Install the upper optics frame [F] (9 screws).
25. Connect the scanner HP sensor connector.
26. Install the screw securing the granding wire.



A246R588.WMF

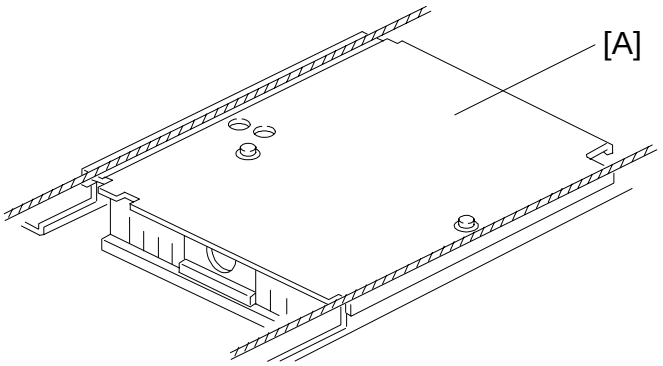
27. Turn on the main switch and perform the scanner free run for about 5 minutes to break in the wires and to confirm correct scanner movement as follows:

- Scanner Free Run -

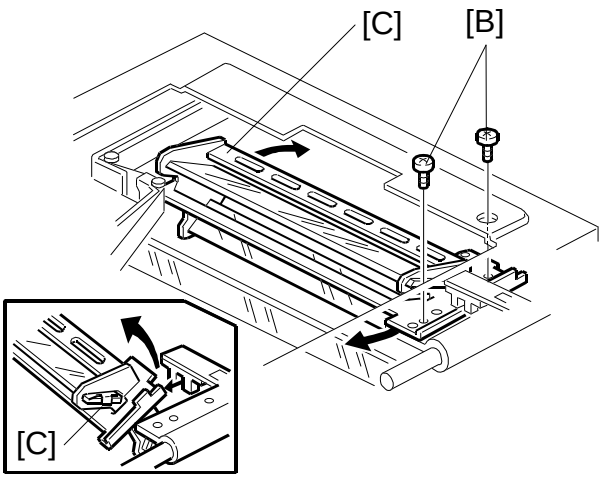
1) Remove the upper rear cover. (Refer to the Upper Cover Removal, section 6.1.2.)
2) Turn on No.3 and No.4 of DIP SW 101 on the optics control board.
3) Turn on the main switch.
4) Short-circuit TP516 and TP510 (GND), then the machine automatically starts the scanner free run.
5) Turn off the main switch.

28. After performing the scanner free run, check the second scanner alignment then the first scanner alignments.
29. Re-assemble the parts.
30. Check the copy image.

6.3.8 THIRD SCANNER REMOVAL



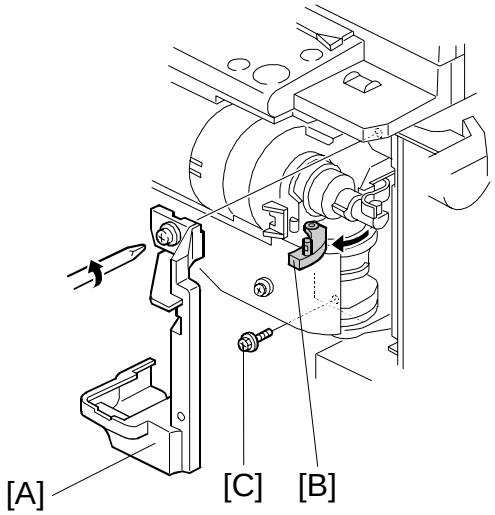
A246R589.WMF



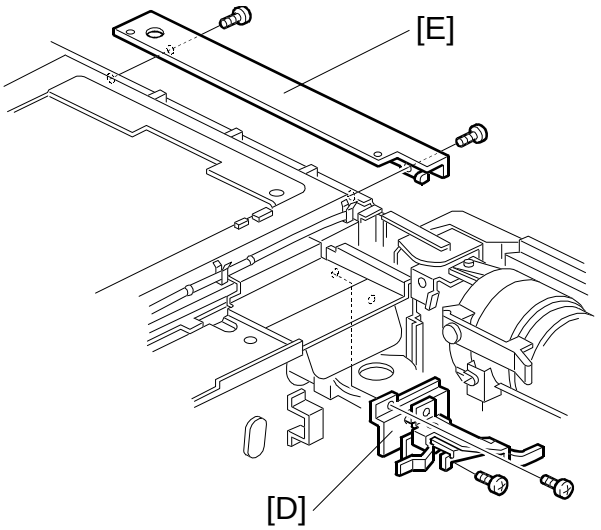
A246R590.WMF

1. Remove the exposure glass. (Refer to Exposure Glass Removal, section 6.3.1.)
2. Remove the upper cover. (Refer to Upper Cover Removal, section 6.1.7.)
3. Remove the lens unit cover [A] (2 screws).
4. Remove the two screws [B] securing the front third scanner bracket.
5. Remove the third scanner [C], as shown.

6.3.9 THIRD SCANNER DRIVE MOTOR/HP SENSOR REPLACEMENT

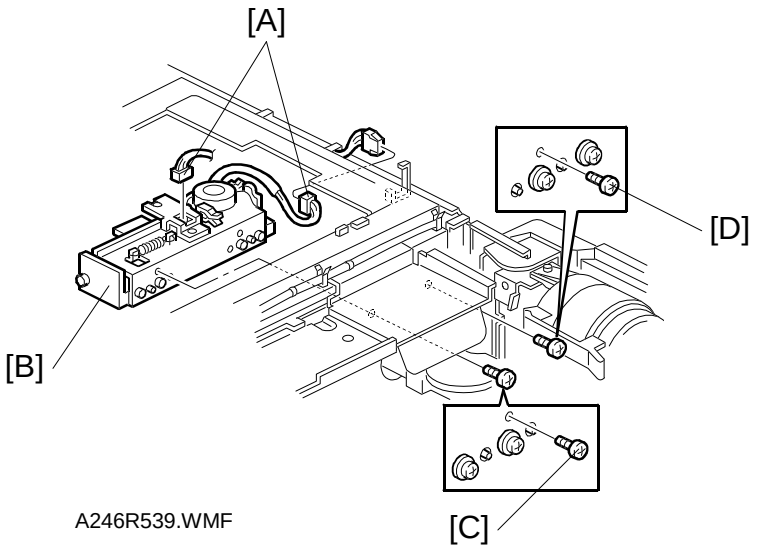


A246R512.WMF

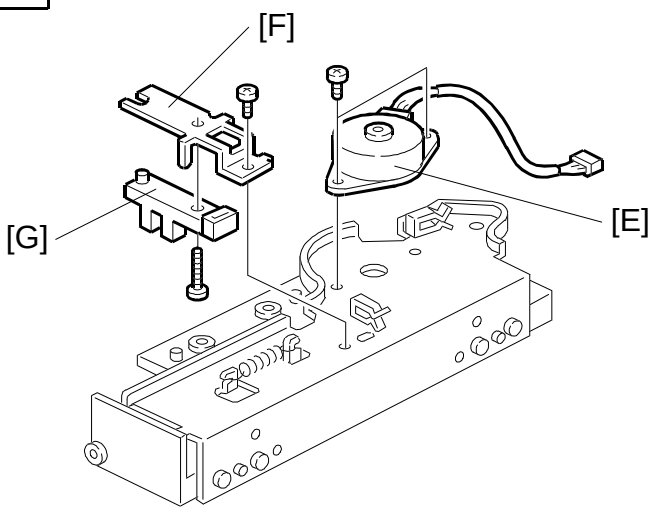


A246R538.WMF

1. Remove the third scanner unit. (Refer to the Third Scanner Removal, section 6.3.8.)
2. Remove the shutter inner cover [A]. (Refer to the Shutter Inner Cover Removal, section 6.1.3.)
3. Release the shutter lever [B] fully to the front.
4. Remove the screw [C] securing the toner bottle holder bracket.
5. Swing out the toner bottle holder (1 screw).
6. Remove the toner opening bracket [D] (2 screws).
7. Remove the harness cover bracket [E] (2 screws).



A246R539.WMF

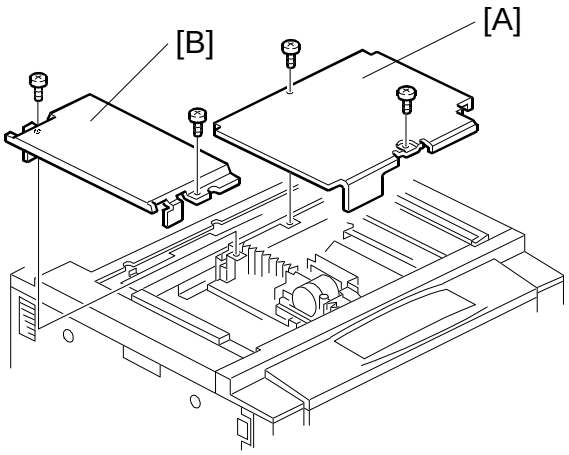


A246R540.WMF

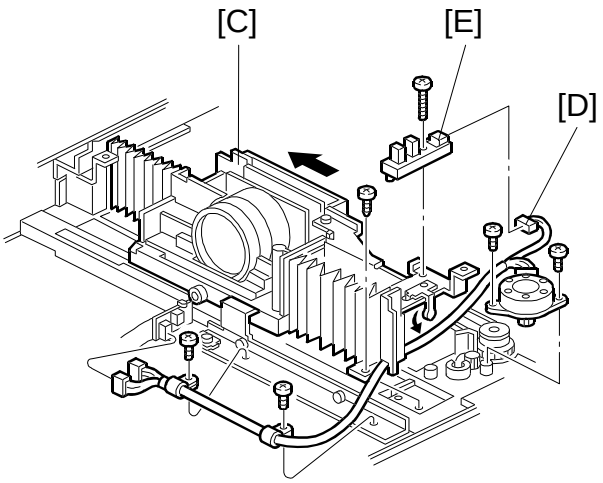
8. Disconnect the two connectors [A].
9. Remove the third scanner drive unit [B] (2 screws [C, D]).
10. Replace the third scanner drive motor [E] (1 connector, 2 screws).
11. Remove the third scanner HP sensor bracket [F] (1 connector, 1 screws).
12. Replace the third scanner HP sensor [G] (1 screw).

6.3.10 LENS HORIZONTAL DRIVE HP SENSOR REPLACEMENT

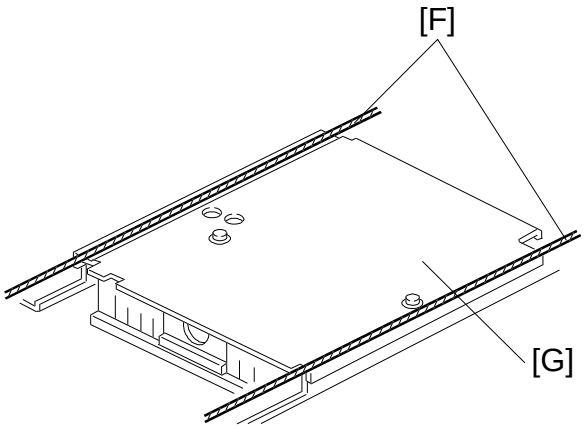
- EU and Asia copiers -



A246R535.WMF



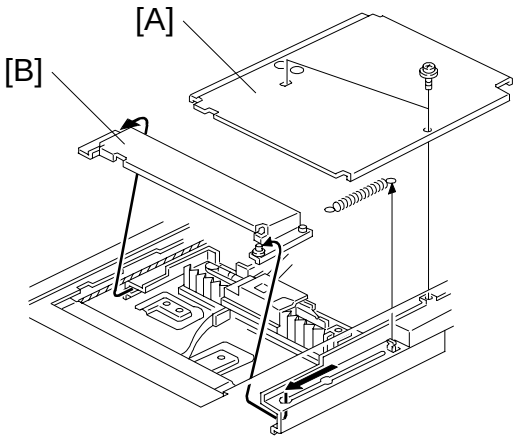
A246R536.WMF



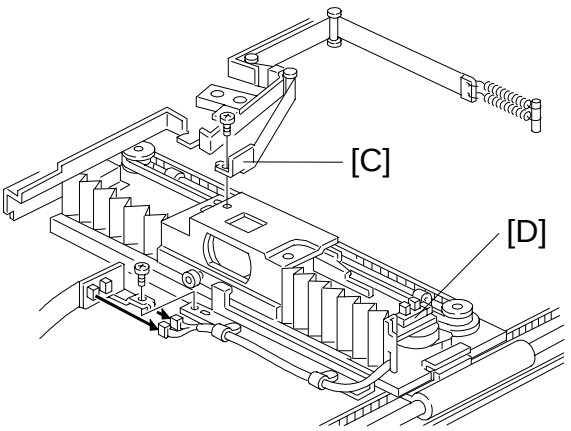
A246R537.WMF

1. Remove the exposure glass. (Refer to Exposure Glass Removal, section 6.3.1.)
2. Remove the lens unit cover [A] (2 screws).
3. Remove the light shielding plate [B] (2 screws).
4. Move the lens unit [C] to the rear side of the machine, as shown.
   NOTE: Do not touch the lens with bare hands.
5. Disconnect the connector [D].
6. Replace the lens horizontal drive HP sensor [E] (1 screw).
   NOTE: When re-installing the lens unit cover, set the scanner wires [F] on the lens unit cover [G], as shown.

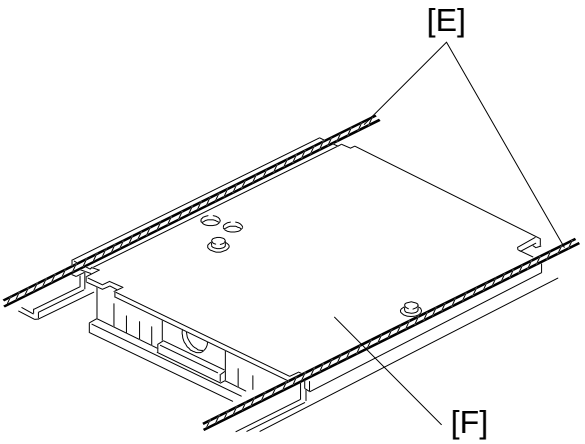
- NA copiers -



A246R712.WMF



A246R711.WMF

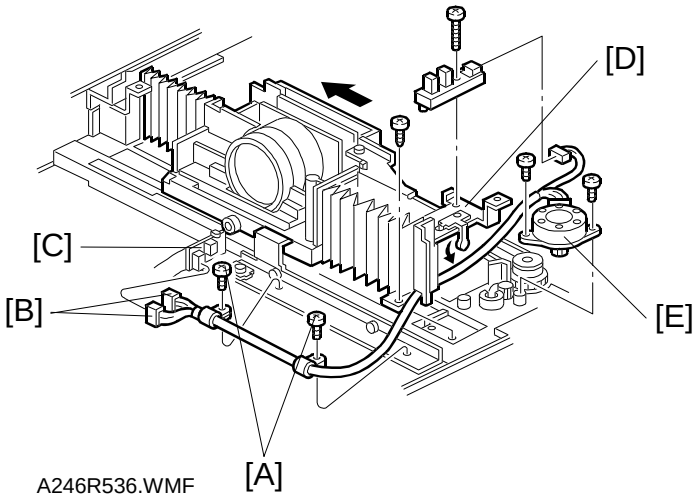


A246R537.WMF

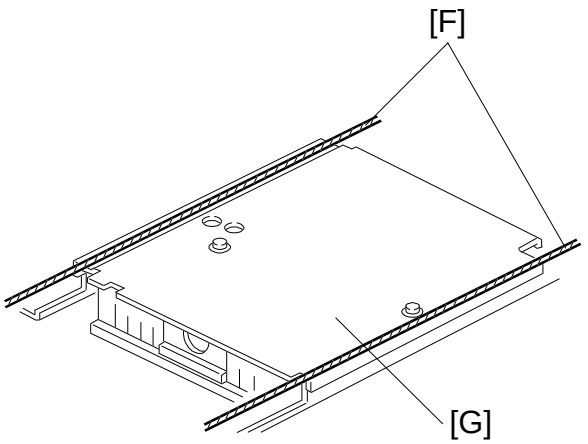
1. Remove the exposure glass. (Refer to Exposure Glass Removal, section 6.3.1.)
2. Remove the lens unit cover [A] and light shielding plate [B]. (Refer to Scanner Drive Wires Replacement, section 6.3.7.)
3. Remove the light shielding mylar bracket [C] (1 screw).
   NOTE: When re-installing the mylar bracket, be sure not to create any gap between the bracket and the lens cover.
4. Replace the lens horizontal drive HP sensor [D] (1 screw, 1 connector).
   NOTE: When re-installing the lens unit cover, set the scanner wires [E] on the lens unit cover [F], as shown.

6.3.11 LENS HORIZONTAL DRIVE MOTOR REPLACEMENT

- EU and Asia copiers -



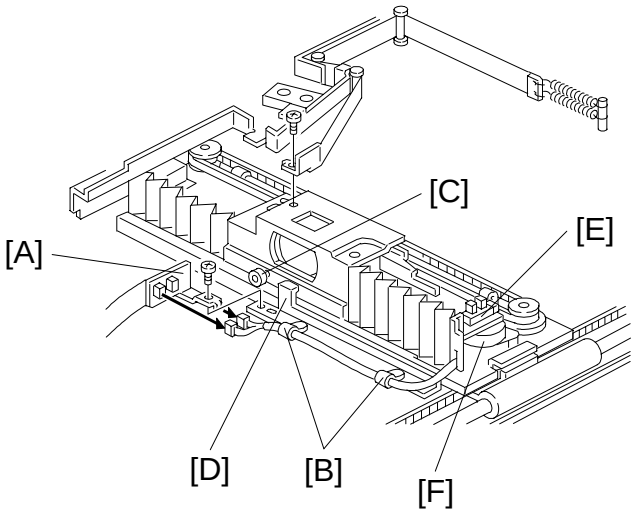
A246R536.WMF



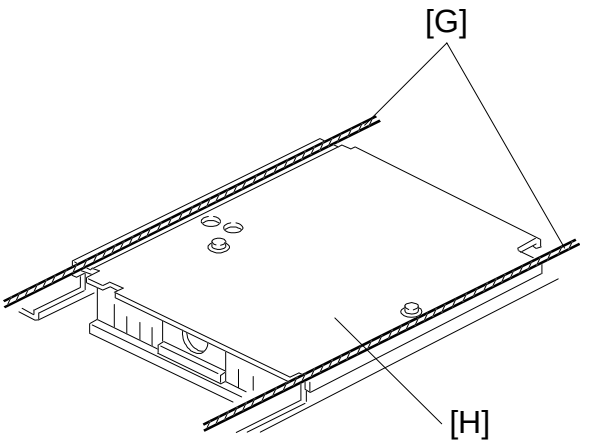
A246R537.WMF

1. Perform steps 1 to 5 of Lens Horizontal Drive Motor Replacement (section 6.3.10 for EU and Asia copiers).
2. Remove the two screws [A] securing the clumps.
3. Disconnect the two connectors [B]
   NOTE: When disconnecting the connector, be careful not to damage the connector on the flat cable bracket [C]. When re-connecting the connector, hold the flat cable bracket, then connect it.
4. Remove the lens horizontal drive HP sensor bracket [D] (1 screw).
5. Replace the lens horizontal drive motor [E] (2 screws).
   NOTE: When re-installing the lens unit cover, set the scanner wires [F] on the lens unit cover [G], as shown.

- NA copiers -



A246R711.WMF

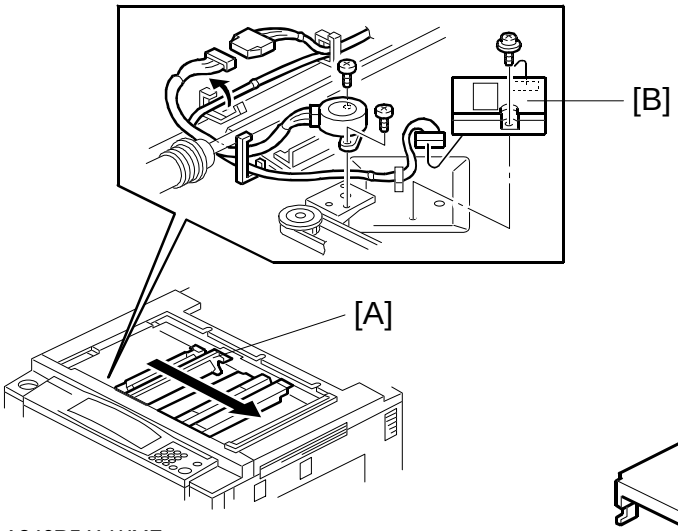


A246R537.WMF

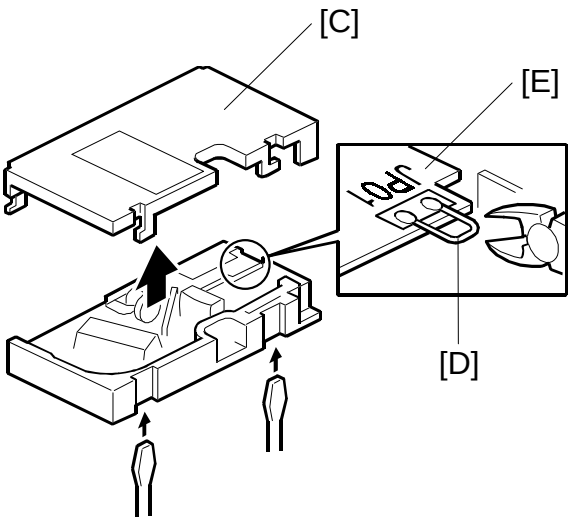
1. Perform steps 1 to 3 of Lens Horizontal Drive Motor Replacement (section 6.3.10 for NA copiers).
2. Remove the flat cable bracket [A] (1screw, 2 connectors).
3. Remove the two screws securing the clumps [B].
4. Position the roller [C] underneath the bracket [D].
5. Remove the lens horizontal drive HP sensor bracket [E] (1 screw).
6. Replace the lens horizontal drive motor [F] (2 screws).
   NOTE: When re-installing the lens unit cover, set the scanner wires [G] on the lens unit cover [H], as shown.

6.3.12 APS SENSOR ADJUSTMENT (SENSITIVITY DOWN)

NOTE: Perform this adjustment, if original size miss detection occurs frequently.



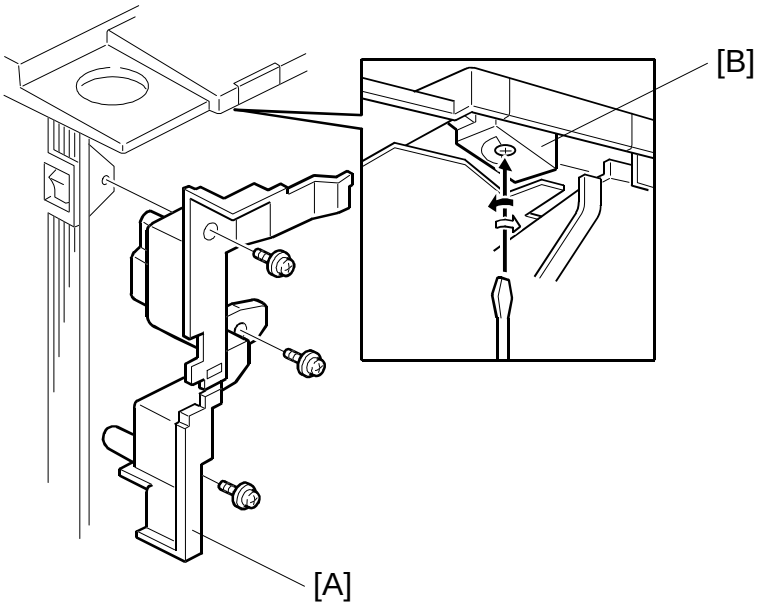
A246R541.WMF



A246R542.WMF

1. Remove the exposure glass. (Refer to Exposure Glass Removal, section 6.3.1.)
2. Move the first scanner [A] to the cutout position at the rear frame.
3. Remove the APS sensor [B].
4. Open the cover [C].
5. Cut the jumper line (JP01) [D].
   NOTE: Do not touch the PCB [E].
6. Close the cover and re-install the APS sensor.
7. Perform APS Size Calibration. (Refer to APS Size Calibration, section 6.10.6.)

6.3.13 ARS SENSOR ADJUSTMENT

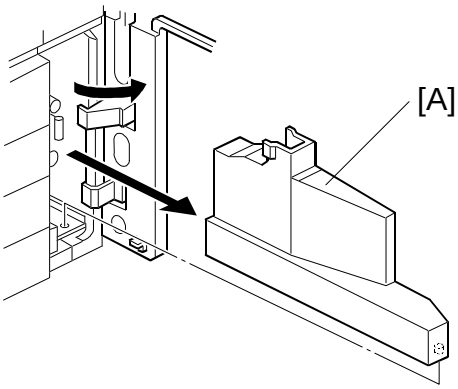


A246R591.WMF

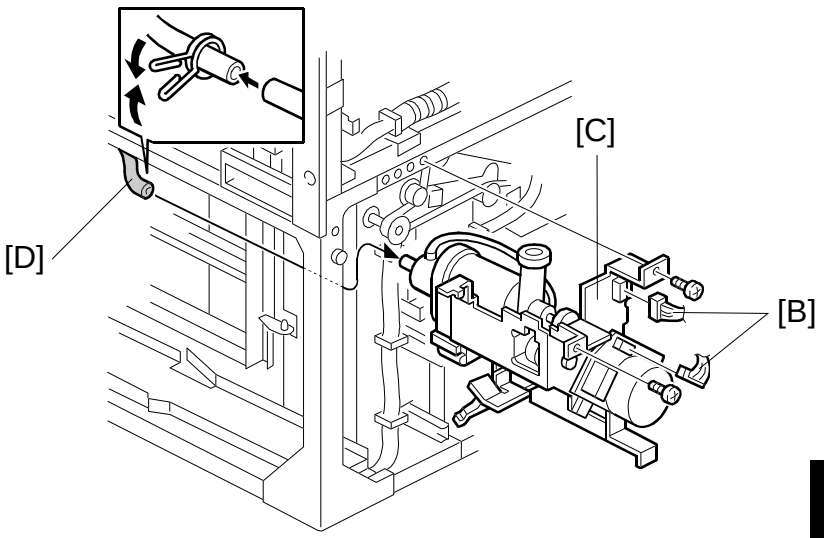
1. Turn off the main switch.
2. Remove the upper left inner cover [A]. (Refer to Upper Left Inner Cover Removal, section 6.1.3.)
3. Adjust the ARS sensor [B].
   - black allow: sensitivity down
   - white allow: sensitivity up

6.4 TONER RECYCLING

6.4.1 TONER RECYCLING UNIT REMOVAL



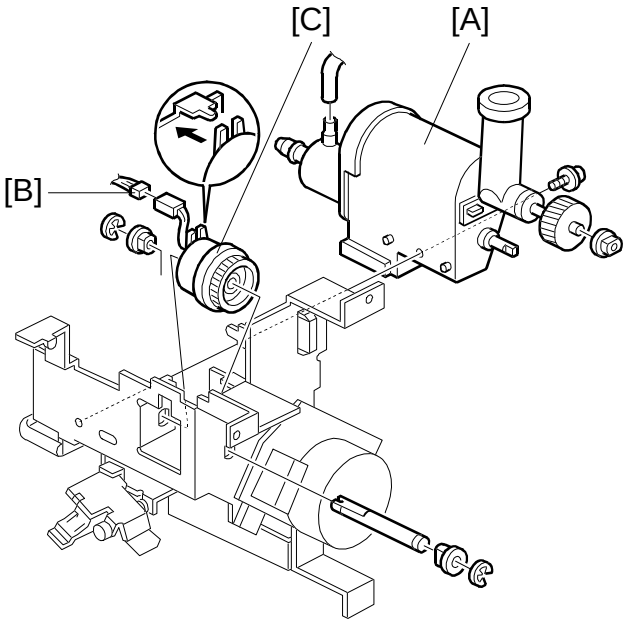
A246R592.WMF



A246R593.WMF

1. Turn off the main switch.
2. Open the front cover.
3. Shift the toner collection bottle [A] upward and remove it.
4. Remove the lower right cover. (Refer to Lower Right Cover Removal, section 6.1.4.)
5. Remove the lower rear cover. (Refer to Lower Rear Cover Removal, section 6.1.2.)
6. Disconnect the two connectors [B].
7. Remove the toner recycling unit [C] (2 screws).
   NOTE: 1) When disconnecting the tube [D] from the toner recycling unit, be careful not to spill the toner.
   2) Do not lose the ball in the toner recycling unit.

6.4.2 TONER RECYCLING CLUTCH REPLACEMENT

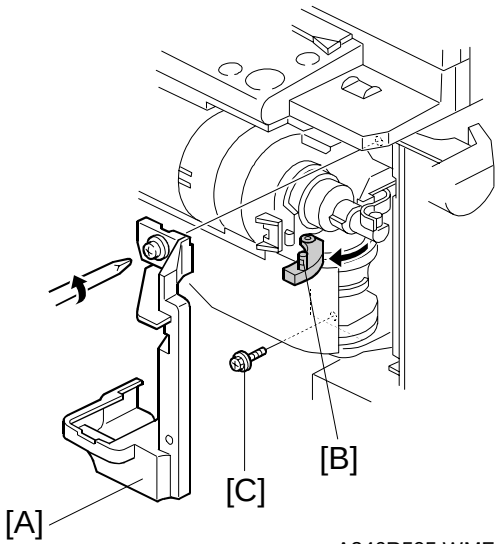


A246R594.WMF

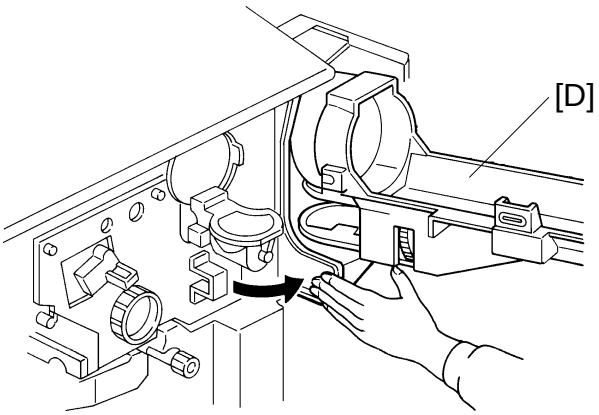
1. Remove the toner recycling unit. (Refer to Toner Recycling Unit Removal, section 6.4.1.)
2. Remove the upper cover [A] (1 screw).
3. Disconnect the connector [B].
4. Replace the toner recycling clutch [C] (2 E-rings and 2 bushings.)

6.5 DEVELOPMENT AND TONER SUPPLY

6.5.1 DEVELOPMENT UNIT REMOVAL

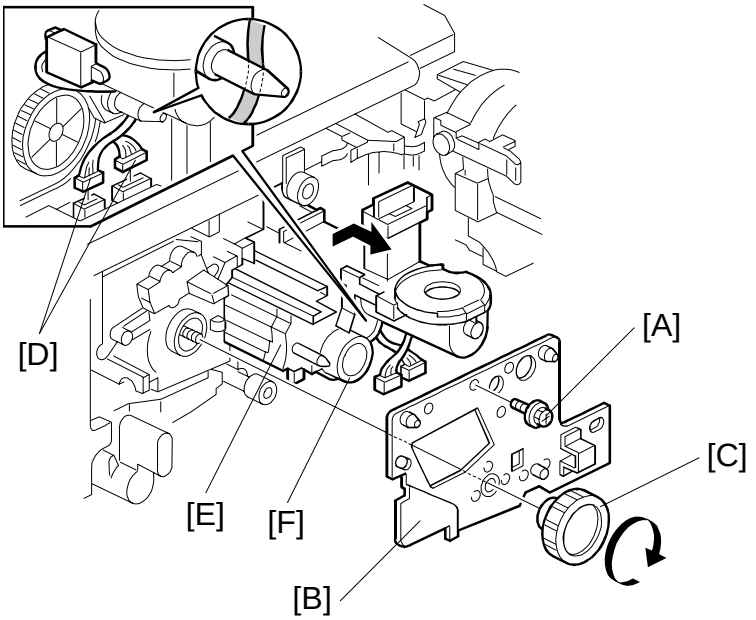


A246R595.WMF



A246R596.PCX

1. Turn off the main switch.
2. Open the front door.
3. Remove the shutter inner cover [A]. (Refer to Shutter Inner Cover Removal, section 6.1.3.)
4. Release the shutter lever [B] fully to the front.
5. Remove the screw [C] securing the toner bottle holder bracket.
6. Swing out the toner bottle holder [D].

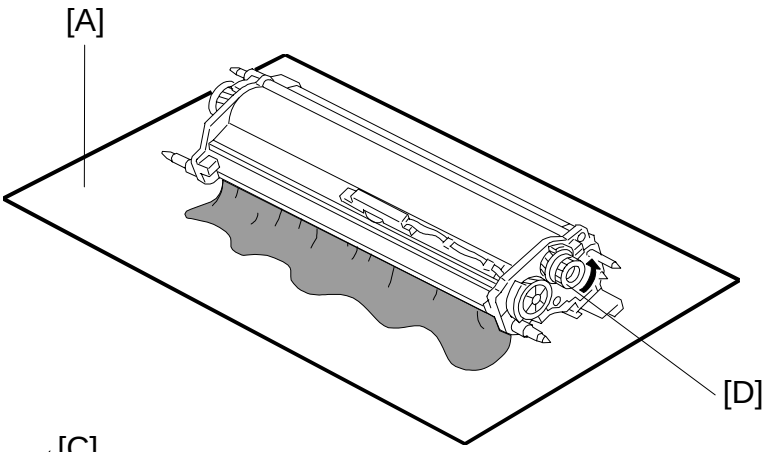


A246R597.WMF

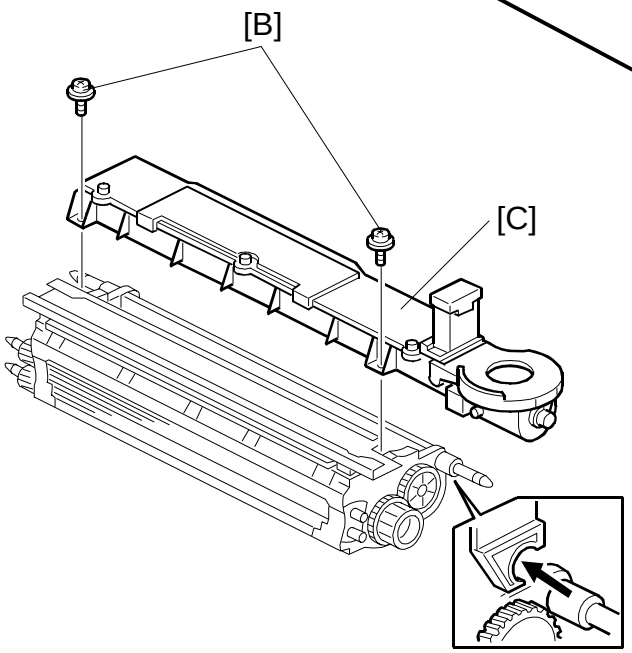
7. Remove the screw [A] securing the drum stay [B].
8. Remove the drum stay knob [C] then take out the drum stay. (Turn the knob clockwise to remove it.)
9. Disconnect the two connectors [D].
10. Pull out the development unit [E].

NOTE: 1) To prevent drum scratches, push the development unit to the right while pulling it out.
2) When installing the development unit, do not forget to set the two connectors [D].
3) When installing the drum stay, be careful not to pinch the harness. Also, keep the harness away from gears.
4) When pulling out the development unit, do not pull on the knob [F].
5) Keep the development unit connector as far as possible away from the development unit when the unit is cleaned using a vacuum cleaner.
6) Do not touch the pins of the development unit connector when the development unit is carried away from the main frame or cleaned.

6.5.2 DEVELOPER REPLACEMENT

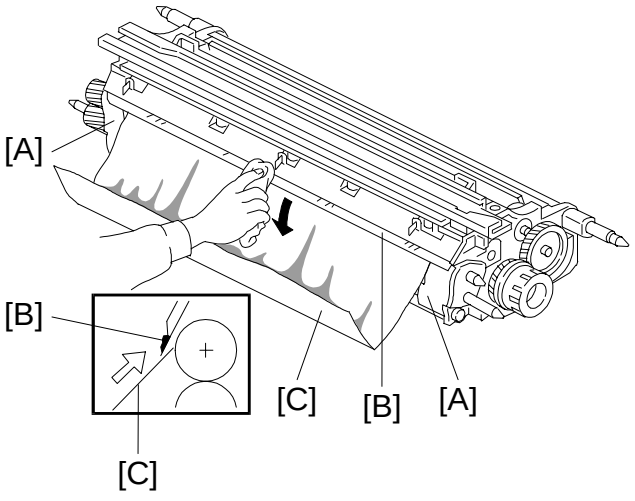


A246R599.WMF

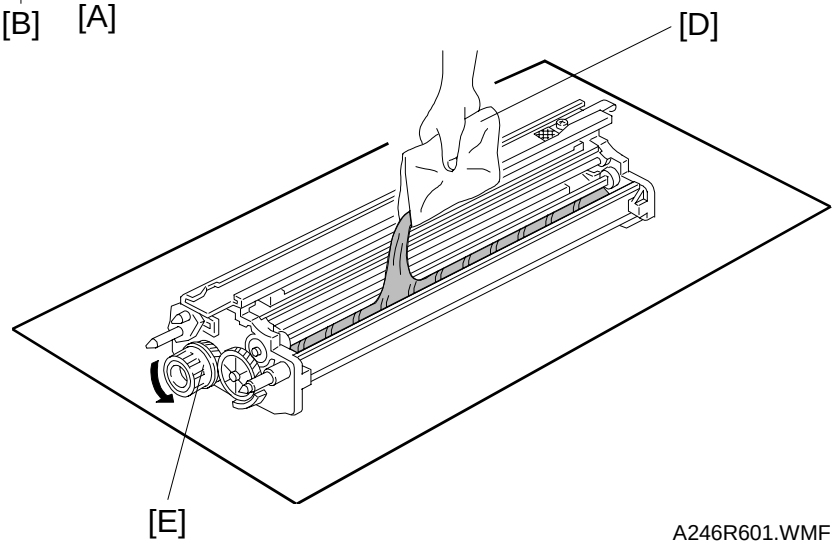


A246R598.WMF

1. Pull out the development unit. (Refer to Development Unit Removal, section 6.5.1.)
2. Place the development unit on the sheet [A].
3. Remove the two screws [B] securing the toner hopper [C].
4. Remove the toner hopper from the development unit, as shown.
   NOTE: Do not turn the toner hopper 90 degrees. Otherwise toner may spill.
5. Turn over the development unit then turn the paddle roller knob [D] to empty developer onto the sheet.
   NOTE: 1) Dispose of used developer according to local regulations.
   2) Make sure that no developer remains on the development rollers or in the development unit.



A246R600.WMF

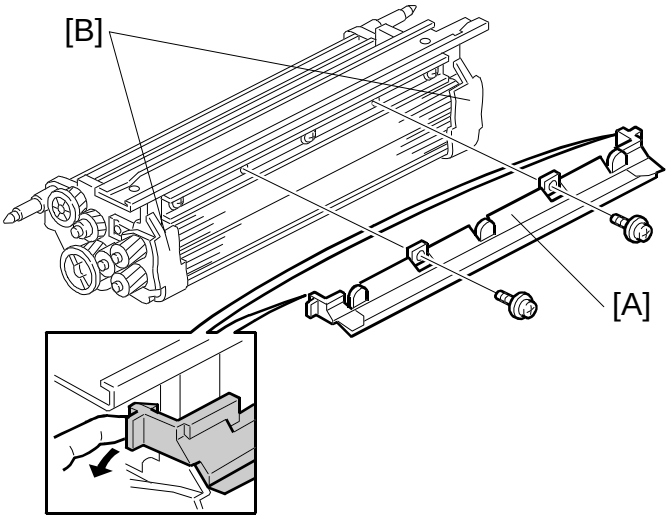


A246R601.WMF

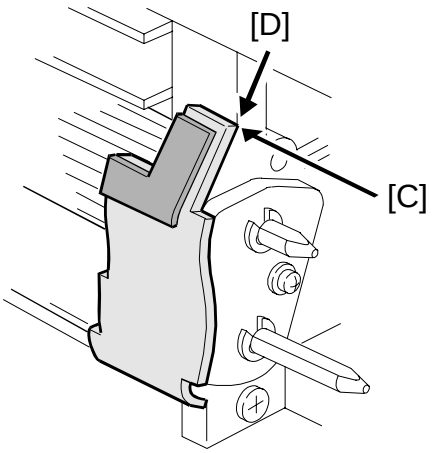
6. Clean the side seals [A] and entrance seal [B].
   NOTE: Cover the sleeve rollers with a sheet of paper [C] to prevent the used developer from being attracted to the sleeve rollers.
7. Evenly pour in one pack of developer [D] while turning the knob [E].
   NOTE: Turn the knob in the direction of the arrow.
8. Re-install the toner hopper, then re-assemble the machine.
   NOTE: 1) Be sure to set to connectors after installing the development unit in the machine.
   2) Tilt the toner hopper so that there is toner near the toner end sensor.
9. Turn on the main switch, then perform Developer Initial Setting (SP1-2-1).

NOTE: 1) Do not make a copy with the new developer before completing the developer initial setting, otherwise the toner density control will be abnormal.
2) If the developer initial setting is not completed, you cannot exit the SP mode by pressing the “Exit” key. If this occurs, turn the main switch off and on, then perform the initial setting again. If the result is the same, see the troubleshooting section “SC352”.

6.5.3 DEVELOPMENT ROLLERS REPLACEMENT

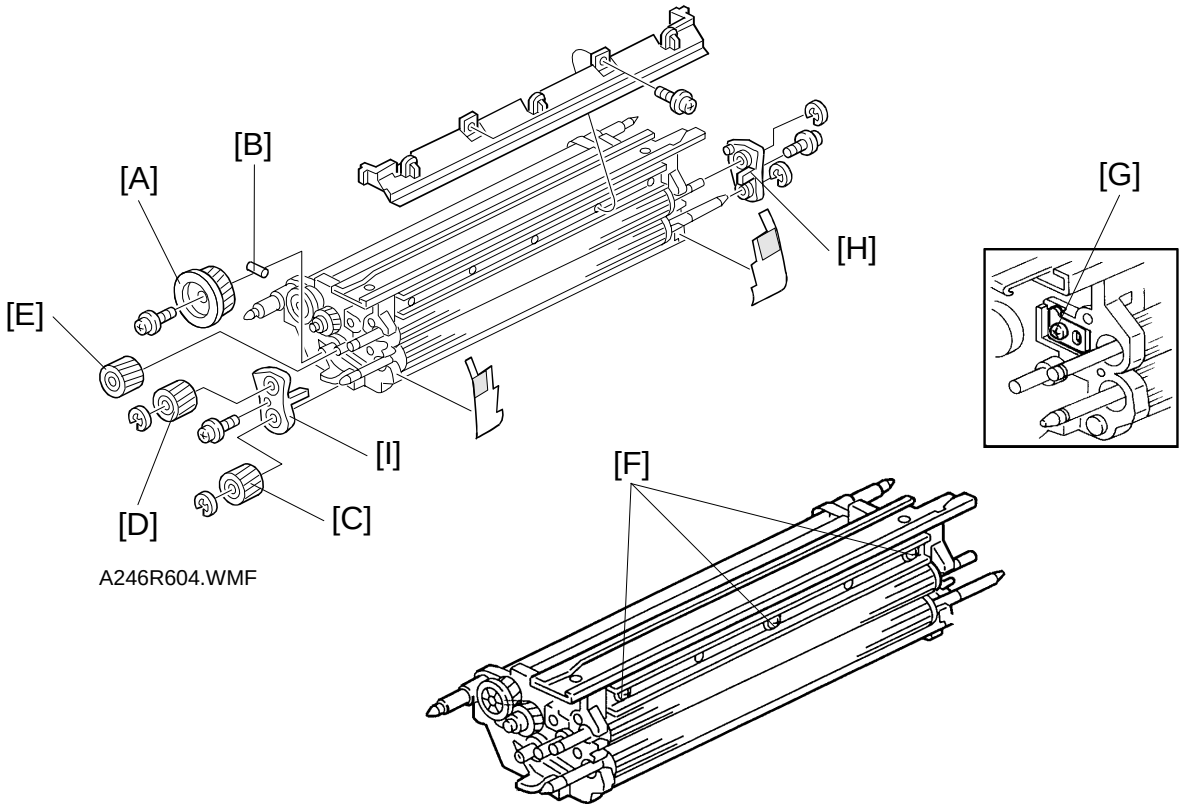


A246R602.WMF



A246R603.WMF

1. Remove the developer. (Refer to Developer Replacement, section 6.5.2.)
2. Remove the developer entrance seal [A] (2 screws, 2 hooks).
3. Remove the front and rear side seals [B].
   NOTE: When re-assembling the development unit, use new side seals and align the edge of the side seals to the corner [C] and the edge [D] as shown.



A246R604.WMF

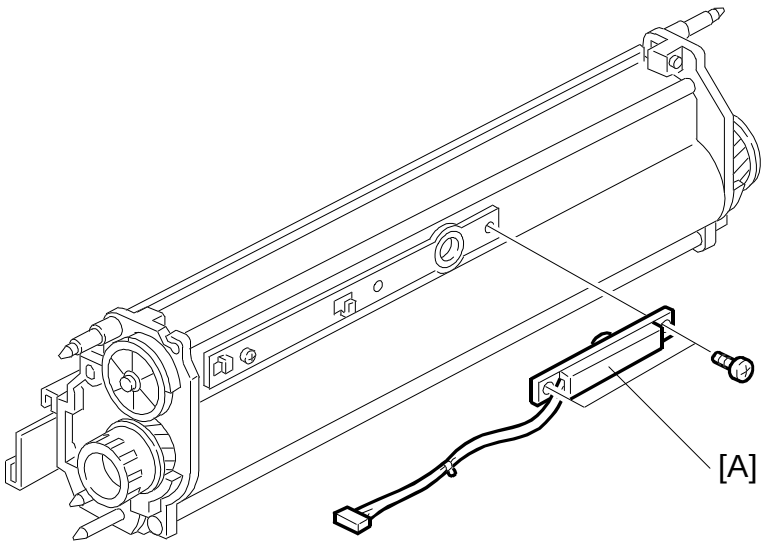
A246R605.PCX

4. Remove the coupling gear [A] (1 screw).
   NOTE: Be careful not to lose the pin [B].
5. Remove the gear [C] (1 E-ring), gear [D] (1 E-ring) and gear [E].

CAUTION: Do not touch the screws at [F] and [G].
If the screws at [F] are loosened, the doctor gap will be improper.
If the screws at [G] are loosened, the photoconductor gap and magnetic field angle will be improper.
If either of them become abnormal, toner density control will be abnormal.

6. Remove the front roller holder [H] (1 screw, 2 E-rings) and rear roller holder [I] (1 screw).
7. Replace the sleeve rollers.
8. Re-assemble the development unit and set the developer, then re-assemble the copier.
   NOTE: 1) If the original developer (already used) is returned to the development unit, do not perform the Developer Initial Setting (SP1-2-1).
   2) If the new developer is set, complete the Developer Initial Setting (SP1-2-1) before making a copy.

6.5.4 TONER DENSITY SENSOR REPLACEMENT

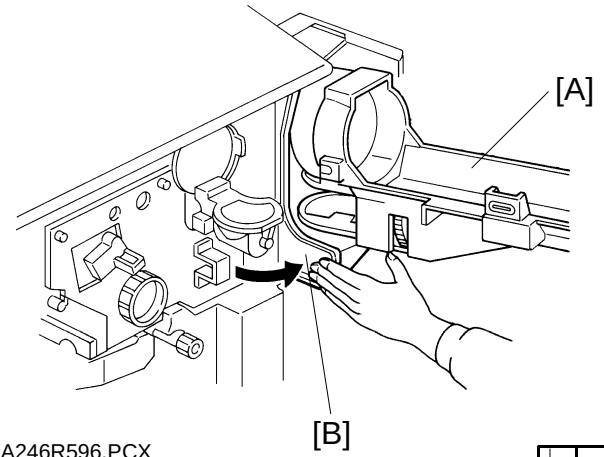


A246R606.WMF

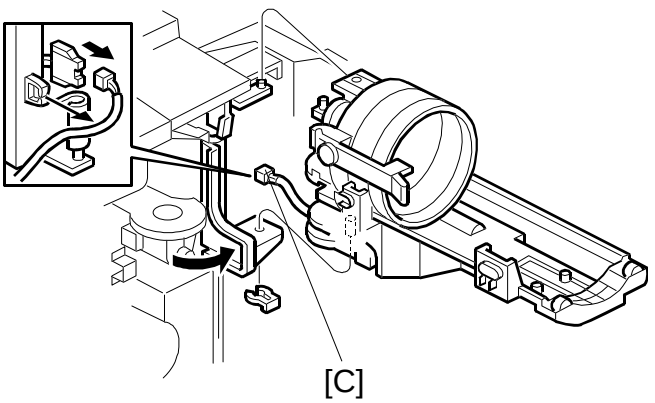
1. Remove the developer. (Refer to Developer Replacement, section 6.5.2.)
2. Replace the toner density sensor [A] (2 screws).
   NOTE: Before installing the toner density sensor, clean the development unit well so that no carrier particles remains in the gap between the toner density sensor and the development unit casing.
3. Install the new developer and perform the Developer Initial Setting (SP1-2-1).

NOTE: Complete the Developer Initial Setting before making a copy.

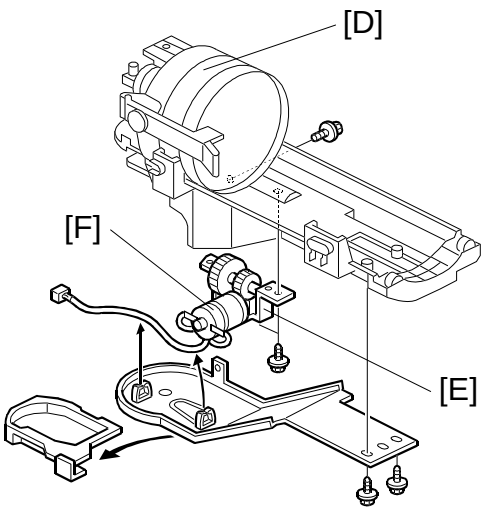
6.5.5 TONER BOTTLE DRIVE MOTOR REPLACEMENT



A246R596.PCX



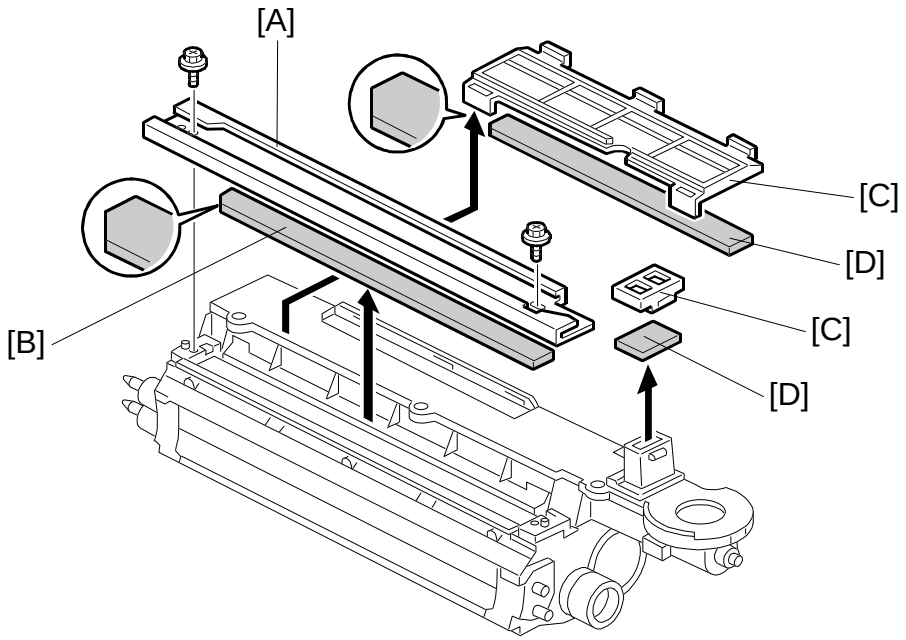
A246R713.WMF



A246R714.WMF

1. Swing out the toner bottle holder [A] with the bracket [B]. (Refer to Development Unit Removal, section 6.5.1.)
2. Remove the toner bottle.
3. Disconnect the connector [C].
4. Remove the toner bottle holder [D] (3 screws).
5. Remove the toner bottle drive motor assembly [E] (2 screws).
6. Replace the toner bottle drive motor [F] (2 screws - M x 4).

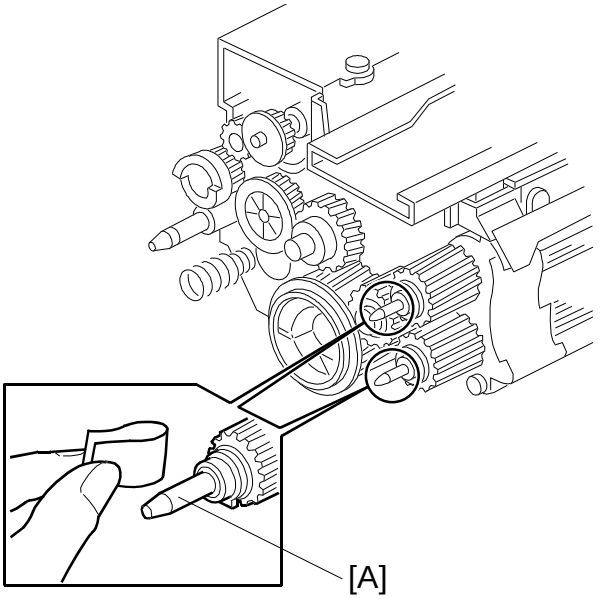
6.5.6 DEVELOPMENT FILTER AND PRESSURE RELEASE FILTER REPLACEMENT



A246R607.WMF

1. Remove the development unit. (Refer to Development Unit Removal, section 6.5.1.)
2. Remove the development guide rail [A] (2 screws).
3. Replace the development filter [B].
4. Remove the filter covers [C].
5. Replace the pressure release filters [D].

6.5.7 DEVELOPMENT ROLLER SHAFT CLEANING

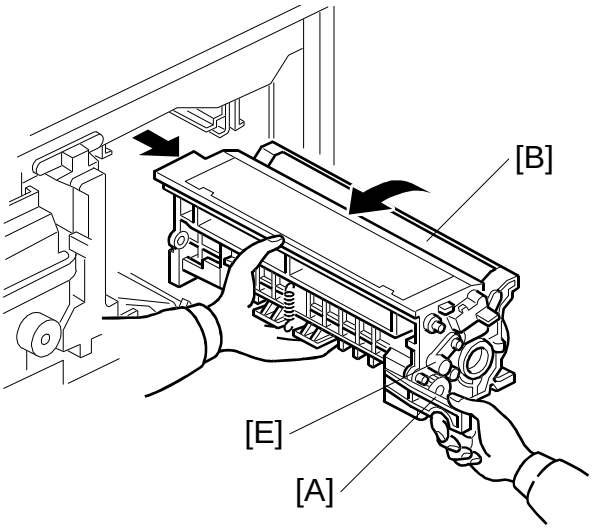


A246R608.WMF

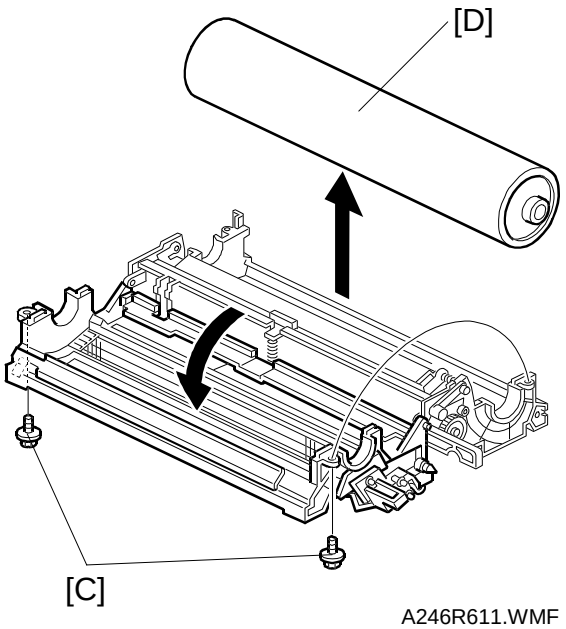
1. Remove the development unit. (Refer to Development Unit Removal, section6.5.1.)
2. Clean the development roller shaft [A] with Teflon tape.

6.6 DRUM UNIT

6.6.1 DRUM UNIT REMOVAL AND OPC DRUM REPLACEMENT



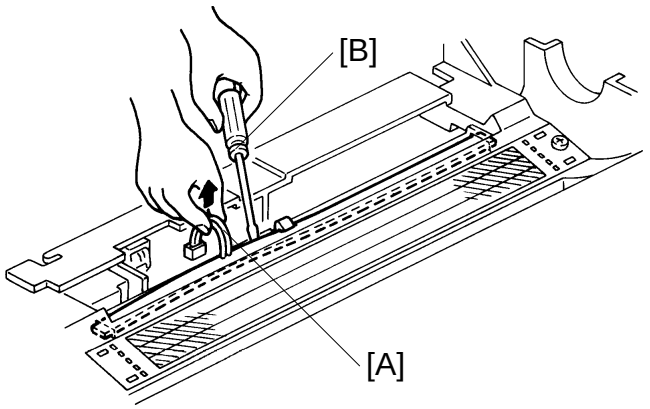
A246R610.WMF



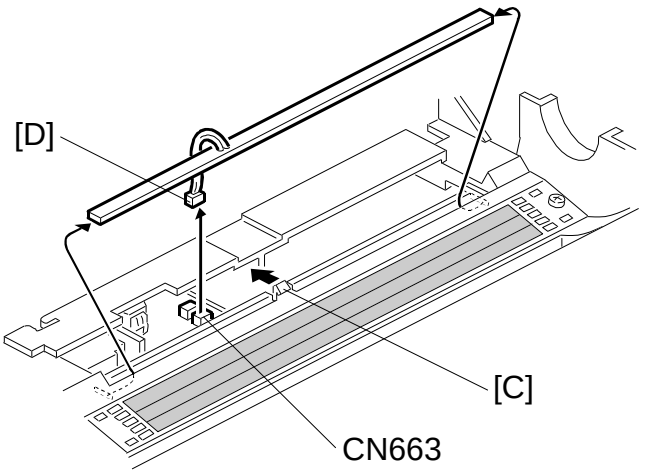
A246R611.WMF

1. Pull out the development unit. (Refer to Development Unit Removal, section 6.5.1.)
2. Lower the transfer belt unit.
3. Pull out the drum unit by holding the knob [A].
   NOTE: Close the protective shutter [B] to protect the OPC drum from light when the drum unit is left outside the machine for servicing.
4. Open the upper drum unit (2 screws [C]).
5. Replace the OPC drum [D]. Then remove the drum protective sheet from the new drum.
   NOTE: When returning the drum unit to the copier, do not forget to open the protective shutter [B].If it is hard to completely set the drum unit in the machine because the gear is disengaged, then push in the drum unit while holding down the cleaning blade release knob [E].

6.6.2 QUENCHING LAMP REPLACEMENT



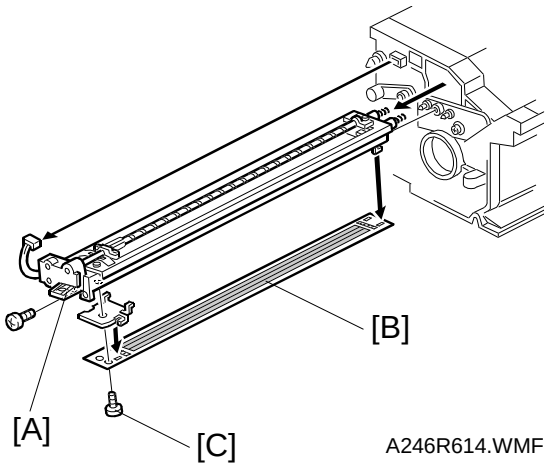
A246R612.PCX



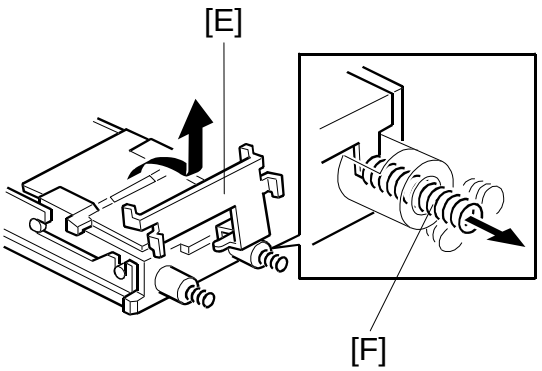
A246R613.WMF

1. Remove the OPC drum. (Refer to OPC Drum Replacement, section 6.6.1.)
   NOTE: Wrap a protective sheet or a few sheets of paper around the drum to protect it from light.
2. Slightly pull up the wires [A] on the quenching lamp, then insert the head of the small flat head screw driver [B] between the quenching lamp and the drum unit casing to release the hook [C] at the center of the quenching lamp.
   NOTE: Do not pull the wire too strongly.
3. Disconnect the connector [D].
4. Replace the quenching lamp.

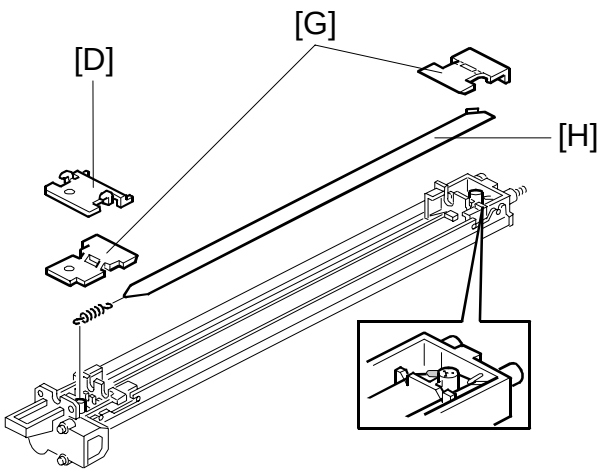
6.6.3 GRID PLATE/CHARGE WIRE/WIRE CLEANER REPLACEMENT



A246R614.WMF

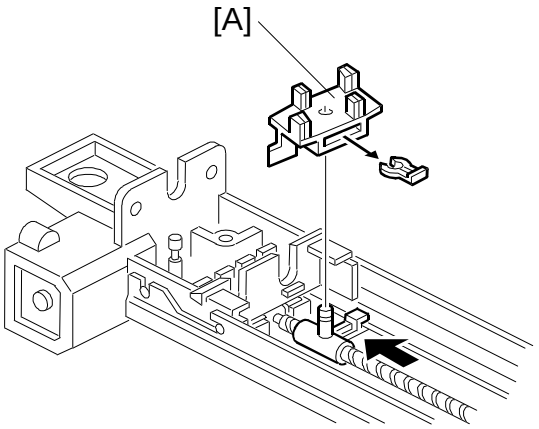


A246R615.WMF

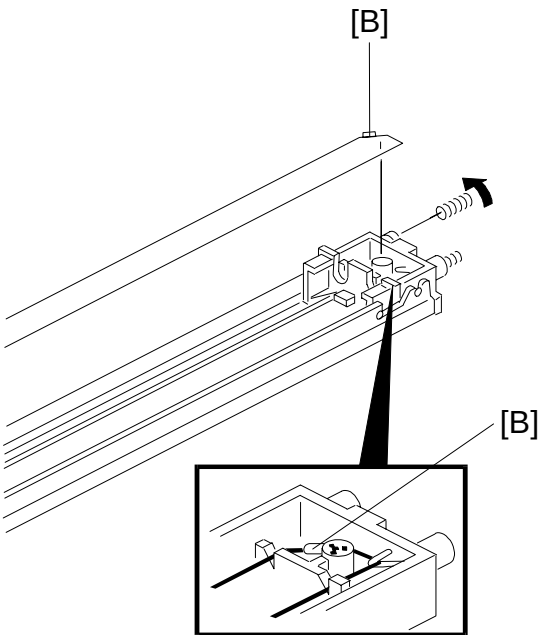


A246R616.WMF

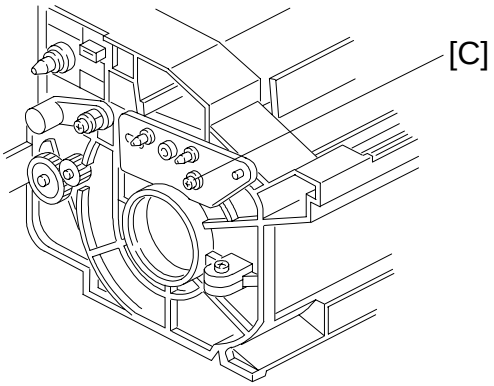
1. Pull out the main charge corona [A] (1 screw, 1 connector).
2. Remove the grid plate [B] (1 plastic screw, 4 hooks).
   NOTE: When installing the grid plate, do not tighten the plastic screw [C] too strongly.
3. Remove the front grid terminal [D], then the rear grid terminal [E], as shown.
   NOTE: When re-installing the rear grid terminal, make sure that the springs [F] are not out of shape.
4. Remove the front and rear end block covers [G].
5. Remove the charge corona wire [H].



A246R617.WMF



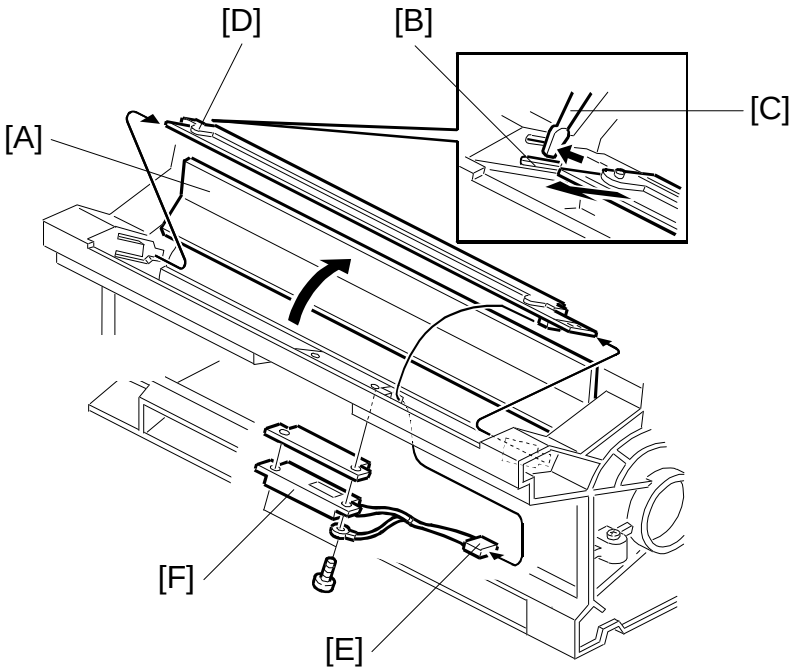
A246R618.WMF



A246R619.WMF

6. Remove the wire cleaner [A] (1 snap ring).
7. Install the wire cleaner and the charge corona wire.
   NOTE: Locate the joint part [B] of the wire in the rear end block as shown.
   Correctly set the wire between the wire cleaner pads.
   Do not loosen the screw [C], otherwise the charge corona height will change.

6.6.4 ERASE LAMP AND DRUM POTENTIAL SENSOR REPLACEMENT

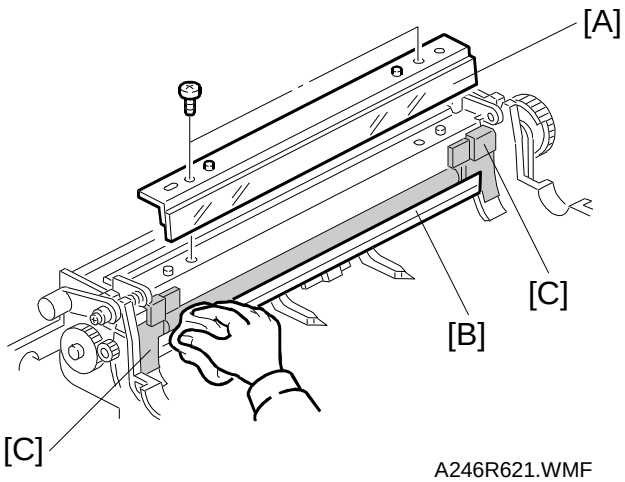


A246R620.WMF

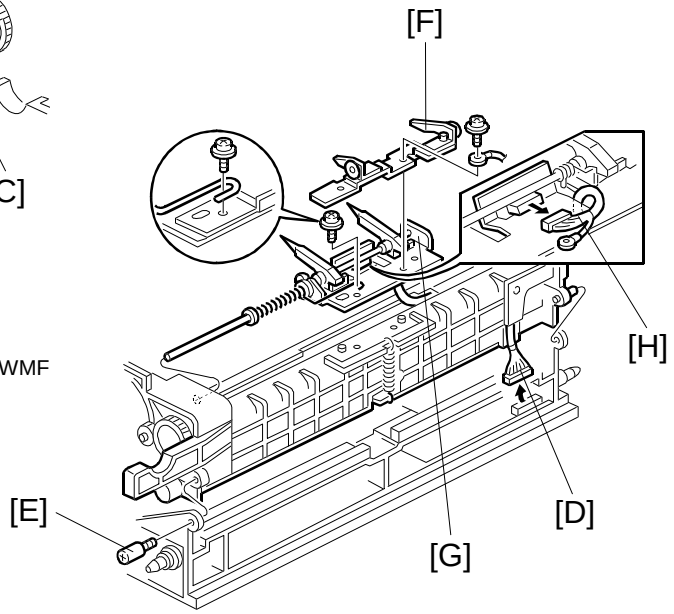
1. Pull out the drum unit. (Refer to the OPC Drum Replacement, section 6.6.1.)
2. Open the drum shutter [A].
3. While pushing the hook [B] to the front by using a small flat head screw driver [C], move up the front side of the erase lamp [D] as shown.
4. Slide the erase lamp to the front to release the rear side of the erase lamp from the drum unit casing.
5. Disconnect the connector [E].
   NOTE: Before removing the drum potential sensor, set a few sheets of paper between the sensor and the OPC drum to protect the drum surface.
6. Replace the drum potential sensor [F] (2 screws).

NOTE: After replacing the drum potential sensor, perform the Process Control Initial Setting (SP1-2-2).

6.6.5 CLEANING BLADE REPLACEMENT



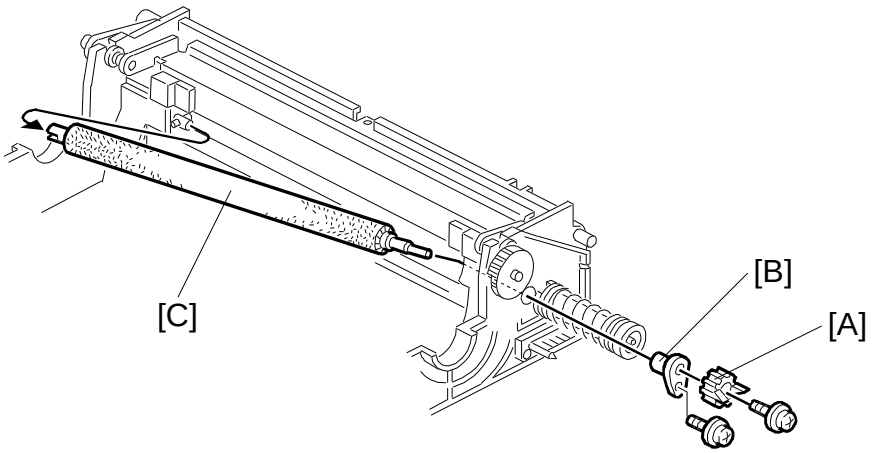
A246R621.WMF



A246R622.WMF

1. Remove the OPC drum. (Refer to Drum Unit Removal and OPC Drum Replacement, section6.6.1.)
2. Remove the cleaning blade [A] (2 screws).
3. Clean the entrance seal [B] and side seals [C].
   NOTE: When a vacuum cleaner is used, to protect the electrical parts from static electricity, disconnect the connector on the charge power pack and remove the ID sensor as follows:
   1) Disconnect the 12 P connector on the charge power pack [D].
   2) Remove the screw [E] and separate the upper and the lower drum units.
   3) Remove the spur bracket [F] (60/70 CPM machine only) and pick-off pawl bracket [G] (2 screws).
   4) Disconnect the connector [H].
   5) While turning the bracket counter-clockwise (front view), slide the pick-off pawl bracket to the rear.
4. Install the new cleaning blade.
   NOTE: 1) Do not clean the edge of the cleaning blade with cloth, otherwise it damages the edge and causes black lines on copy images.
   2) Do not touch the edge of the new cleaning blade, if some setting powder or toner on the blade edge is removed, apply toner there.
   3) When installing the cleaning blade, do not pinch the side seals.

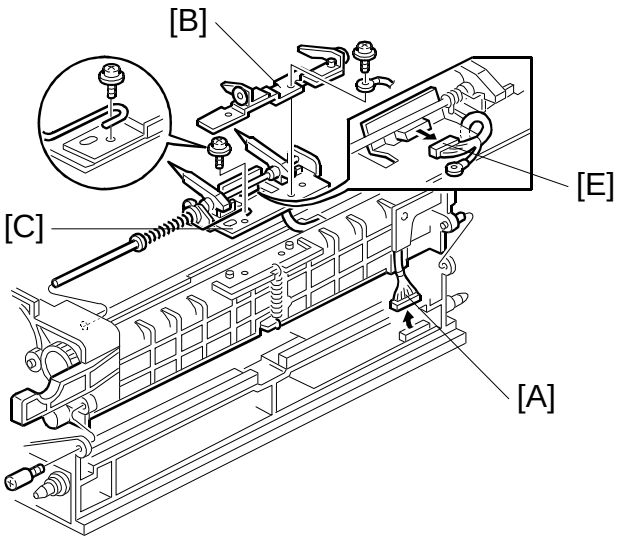
6.6.6 CLEANING BRUSH REPLACEMENT



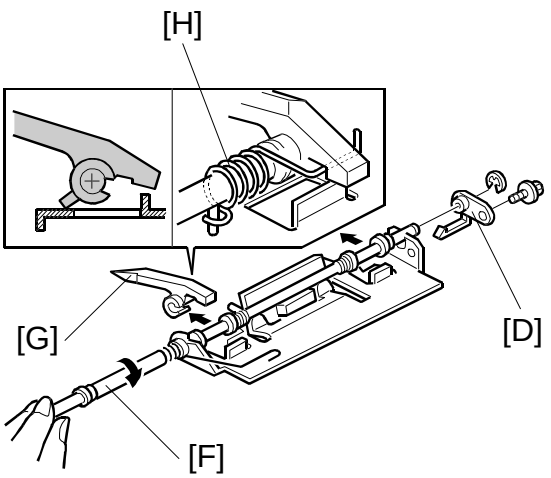
A246R623.WMF

1. Remove the cleaning blade. (Refer to Cleaning Blade Replacement, section 6.6.5.)
2. Remove the coupling gear [A] (1 screw).
3. Remove the bushing [B] (1 screw).
4. Pull the cleaning brush shaft to the rear to release the cleaning brush [C], then remove the cleaning brush.
   NOTE: 1) Do not touch the cleaning brush with oily hands.
   2) After replacement, clean the ID sensor surface.

6.6.7 PICK-OFF PAWL REPLACEMENT



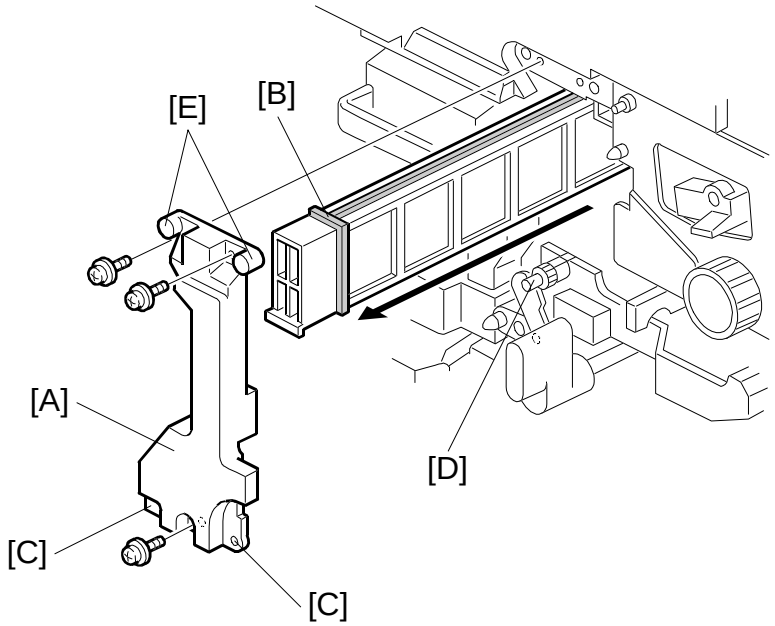
A246R622.WMF



A246R625.WMF

1. Pull out the drum unit. (Refer to the OPC Drum Replacement, section 6.6.1.)
2. Disconnect the 12 P connector [A] on the charge power pack.
3. Remove the spur bracket [B] (60/70 CPM machine only) and pick-off pawl bracket [C] (2 screws).
4. Remove the bushing [D] (1 screw, 1 E-ring).
5. Disconnect the connector [E].
6. While pulling the shaft [F] to the rear, turn the pick-off pawl [G] about 45 degree clockwise (front view) and move up the pick-off pawl.
7. Replace the pick-off pawl.
   NOTE: 1) When re-installing, hook the tension spring [H], as shown.
   2) After replacement, check the smooth movement of the pick-off pawl.

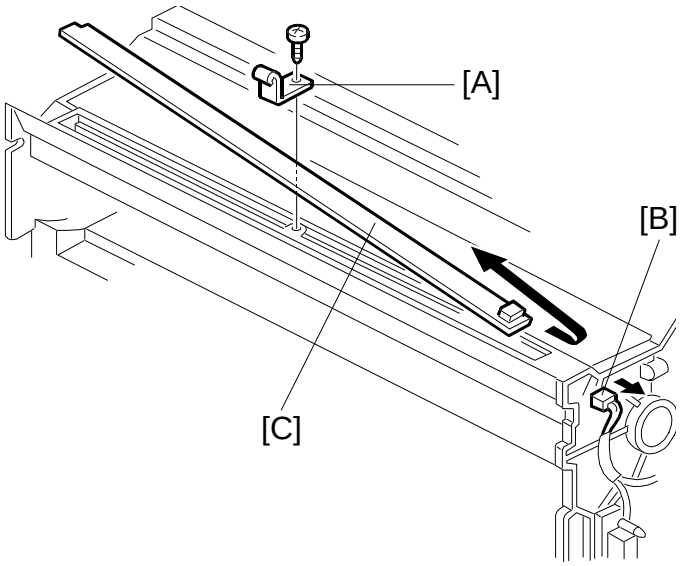
6.6.8 OZONE FILTER REPLACEMENT



A246R626.WMF

1. Open the front door and open the toner bottle holder.
2. Remove the transfer belt unit prop [A] (3 screws).
3. Replace the ozone filter [B].
   NOTE: To install the transfer belt unit prop smoothly, set it order the lower pins [C], drive shaft [D], and the upper pins [E].

6.6.9 PRE-TRANSFER LAMP REMOVAL

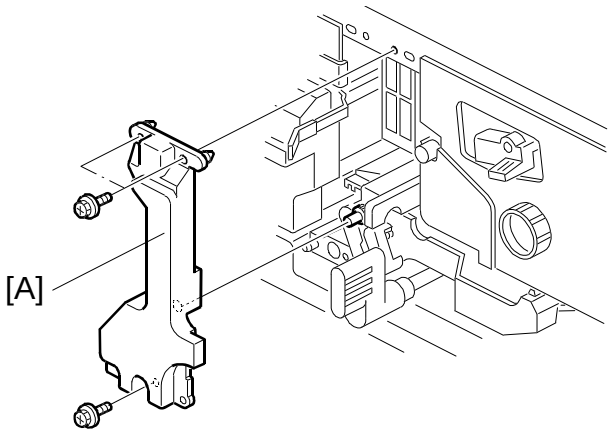


A246R624.WMF

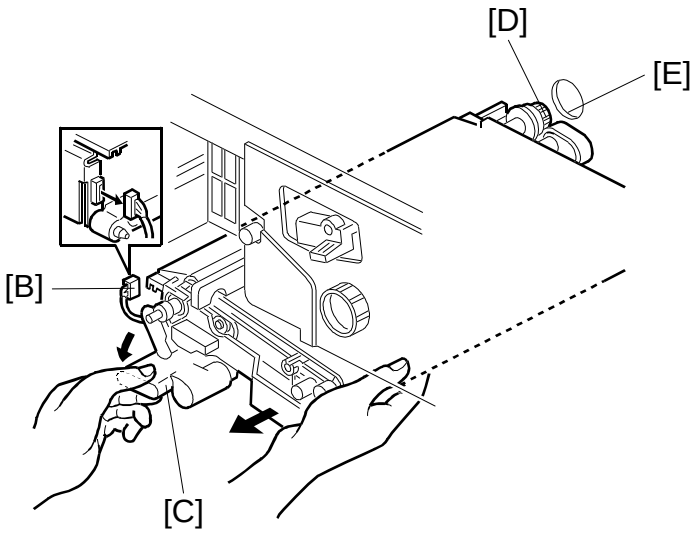
1. Pull out the drum unit. (Refer to OPC Drum Replacement, section 6.6.1.)
2. Remove the supporting plate [A].
3. Disconnect the connector [B].
4. Remove the pre-transfer lamp [C] in the direction, as shown.
   NOTE: If it is removed from the opposite way, the pre-transfer lamp may be damaged.

6.7 TRANSFER BELT UNIT

6.7.1 TRANSFER BELT UNIT REMOVAL/INSTALLATION



A246R627.WMF



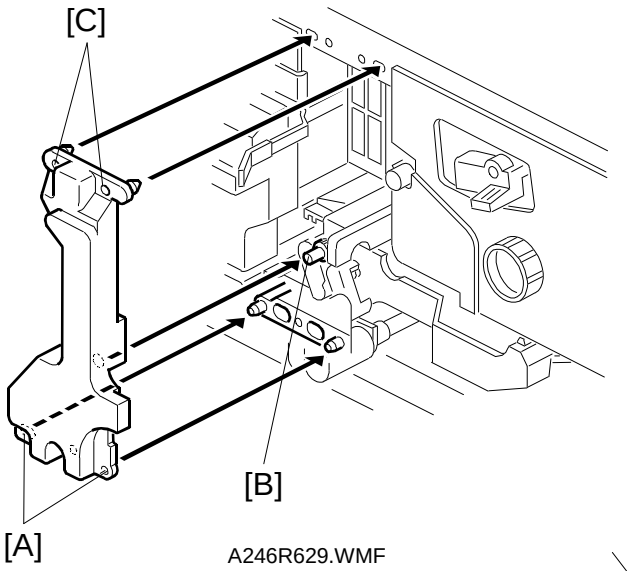
A246R628.WMF

Removal

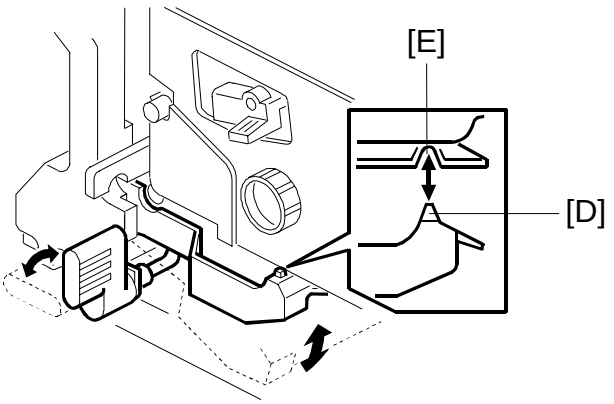
1. Turn off the main switch.
2. Open the front cover and swing out the toner bottle holder.
3. Remove the transfer belt unit prop [A] (3 screws).
4. Disconnect the connector [B].
5. While turning the lever [C] counter-clockwise, take out the transfer belt unit.
   NOTE: 1) Do not touch the transfer belt with oily hands.
   2) Take care not to scratch the OPC drum with part of the transfer belt unit when removing and installing the transfer belt unit.

Installation

1. While turning the lever [C] counter-clockwise, install the transfer belt unit.
   NOTE: Insert the gear [D] in the hole [E] on the rear frame.



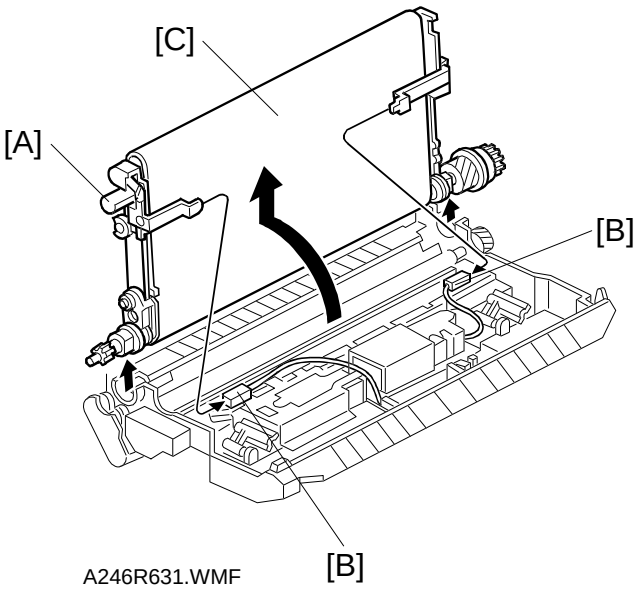
A246R629.WMF



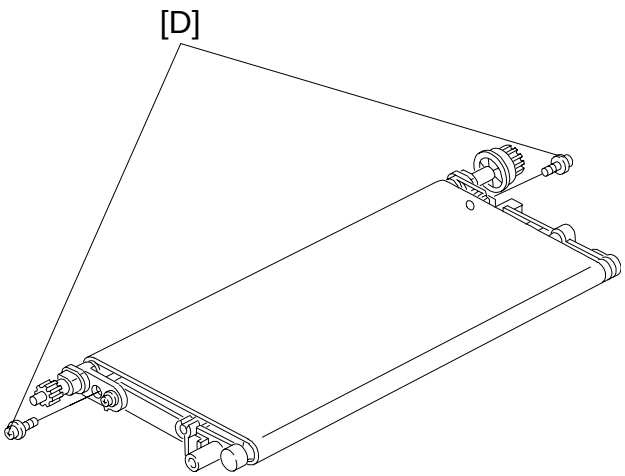
A246R630.WMF

2. Install the transfer belt unit prop (3 screws).
   NOTE: To install the transfer belt unit prop smoothly, set in order the lower pins [A], drive roller shaft [B], and the upper pins [C].
3. After installation, confirm the following points:
   1) Smooth up-down movement of the transfer belt unit,
   2) Part [D] of the transfer belt unit is inside the drum stay,
   3) Part [D] of the transfer belt unit is set in the dent [E] on the drum unit casing.

6.7.2 TRANSFER BELT REPLACEMENT



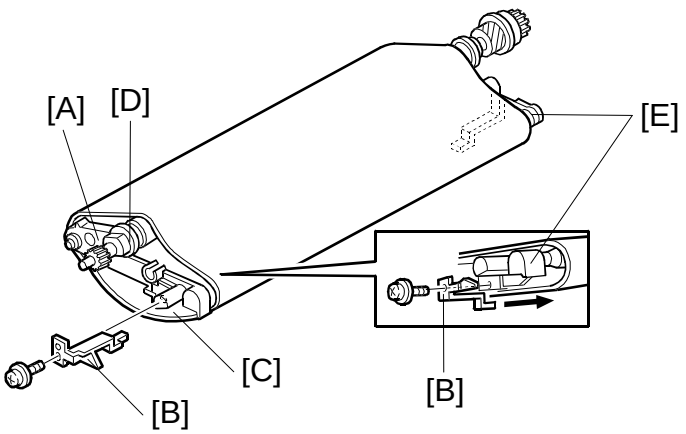
A246R631.WMF



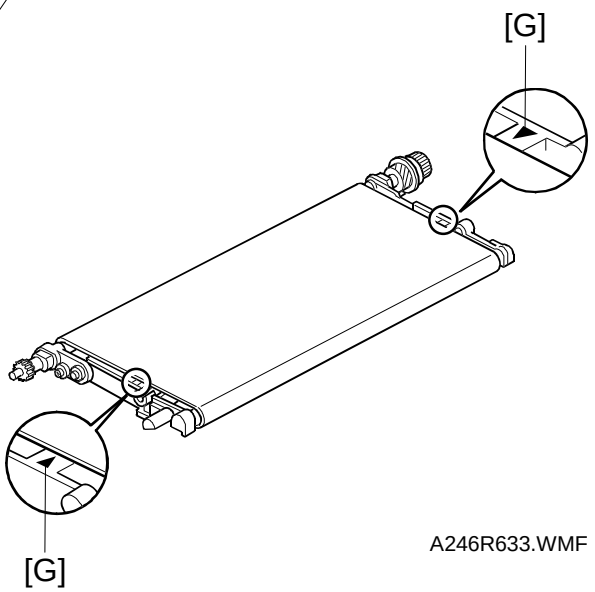
A246R700.WMF

NOTE: Place the transfer belt unit on the sheet to prevent spilling toner, when replacing the transfer belt.

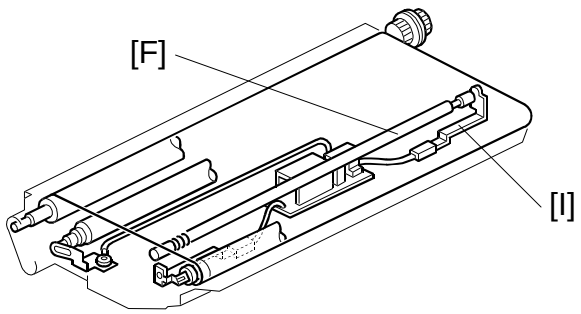
1. Take out the transfer belt unit. (Refer to Transfer Belt Unit Removal.)
2. While raising the knob [A], disconnect the two connectors [B].
3. Turn the transfer belt upper unit [C] 90 degrees counterclockwise, then raise and remove it.
   NOTE: Do not turn the transfer belt upper unit over 90 degrees counter-clockwise. Otherwise the transfer belt maybe damaged.
4. Remove the screws [D].



A246R632.WMF



A246R633.WMF



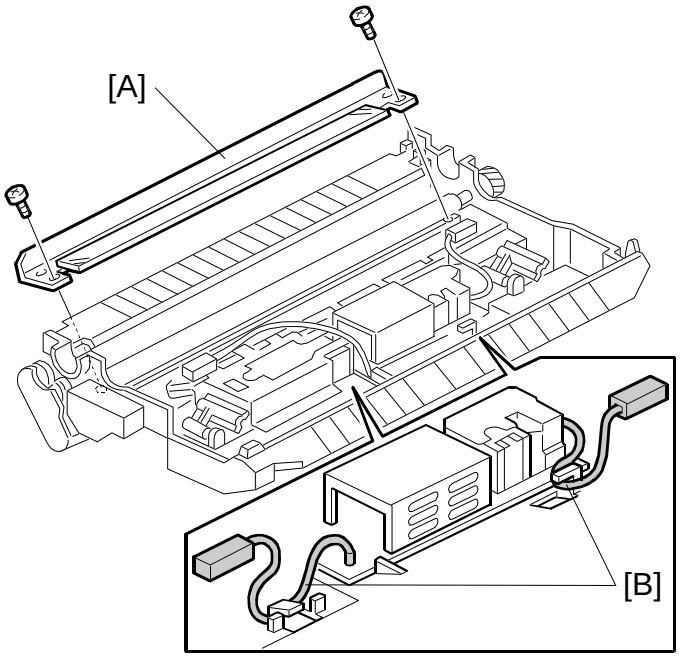
A246R634.WMF

5. Turn the belt drive roller holder [A] clockwise (front view) and remove the bias terminal [B] (1 screw).
6. Replace the transfer belt [C].

NOTE: 1) Before installing the transfer belt, clean both sides of the transfer belt with a dry cloth (do not use alcohol).
2) Before installing the transfer belt, clean the following items with alcohol.
- Belt drive roller [D]
- Belt roller [E]
- Bias roller [F]

3) Position the transfer belt at the center of the belt roller [E]. (Both marks [G] should be visible.)
4) Set the transfer belts inside the bias terminals [B] and [I].
5) When re-connecting the connectors, make sure that the harness do not meet the transfer belt lift lever.

6.7.3 CLEANING BLADE REPLACEMENT

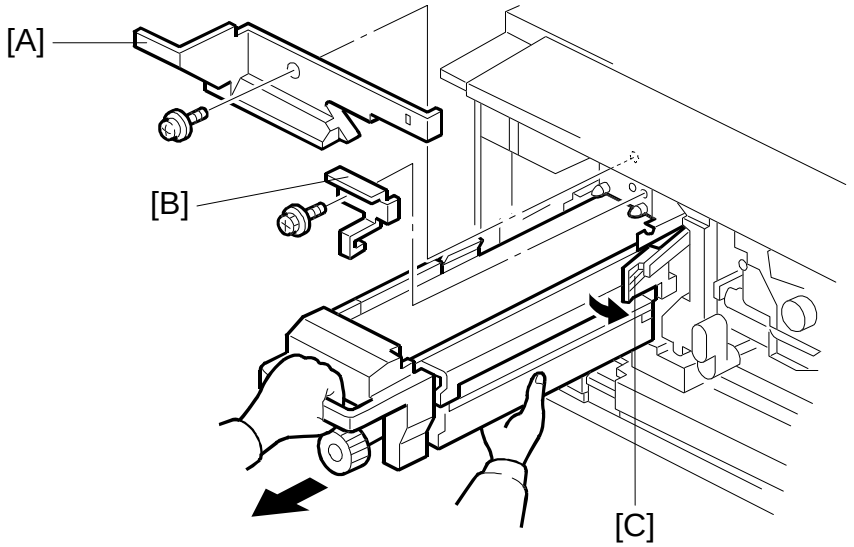


A246R635.WMF

1. Remove the transfer belt upper unit. (Refer to Transfer Belt Replacement, section 6.7.2.)
2. Remove the cleaning blade [A] (2 screws).
3. Install the new cleaning blade.
   NOTE: 1) Do not touch the edge of the cleaning blade. If some of the setting powder on the blade edge is removed, apply setting powder or toner there.
   2) When using a vacuum cleaner, to protect the transfer power pack from static electricity, remove the power pack.
   3) Set the harnesses [B], as shown.

6.8 FUSING UNIT

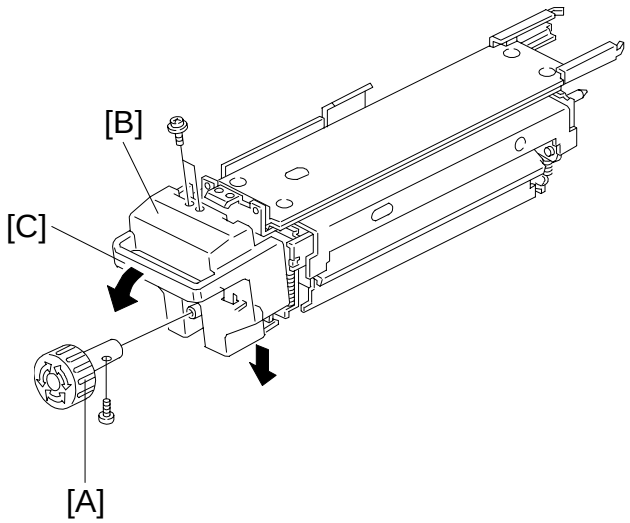
6.8.1 FUSING UNIT REMOVAL



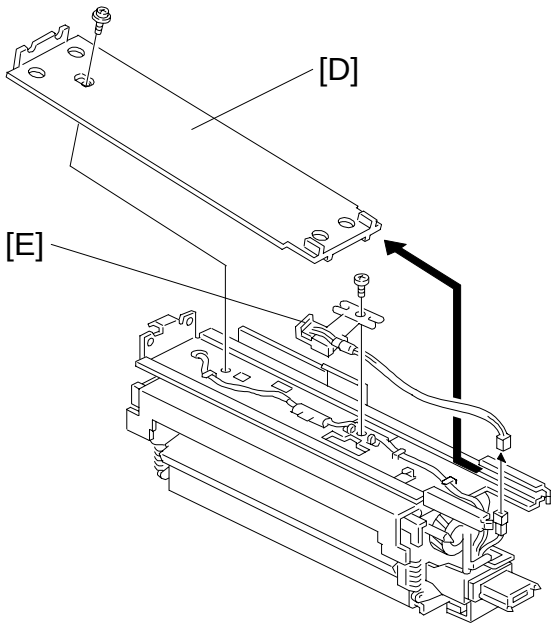
A246R643.WMF

1. Turn off the main switch.
2. Remove the upper inner cover [A]. (Refer to Upper Inner Cover Removal, section 6.1.3.)
3. Remove the stopper [B] (1 screw).
4. While releasing the lever [C], pull out the fusing unit, as shown.
   NOTE: Hold the bottom of the fusing unit, as shown.

6.8.2 FUSING THERMISTOR REPLACEMENT



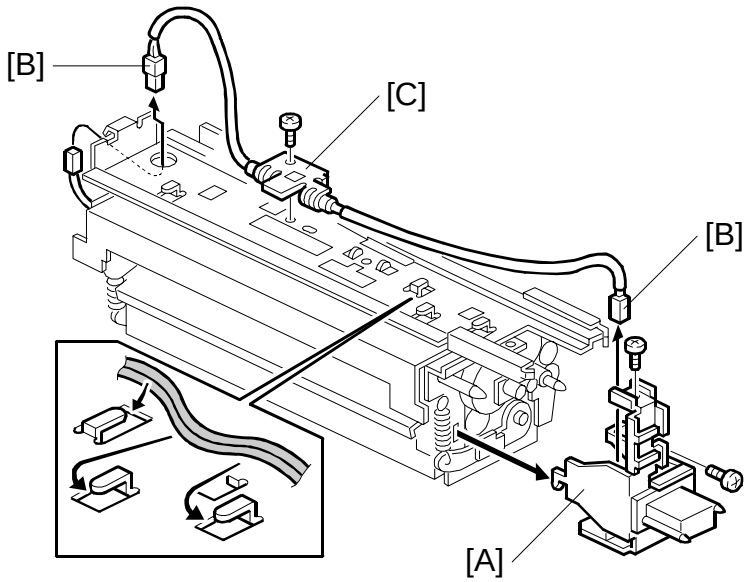
A246R644.WMF



A246R645.WMF

1. Remove the fusing unit. (Refer to Fusing Unit Removal, section 6.8.1.)
2. Remove the knob [A] (1 screw).
3. Remove the two screws securing the fusing front cover [B].
4. Pull the lever [C] then lower the fusing front cover to unhook the fusing unit.
5. Remove the fusing unit upper cover [D] (1 screw).
6. Replace the thermistor [E] (1 screw, 1 connector).
   NOTE: When re-assembling the fusing unit, secure the harness in the clamps correctly.

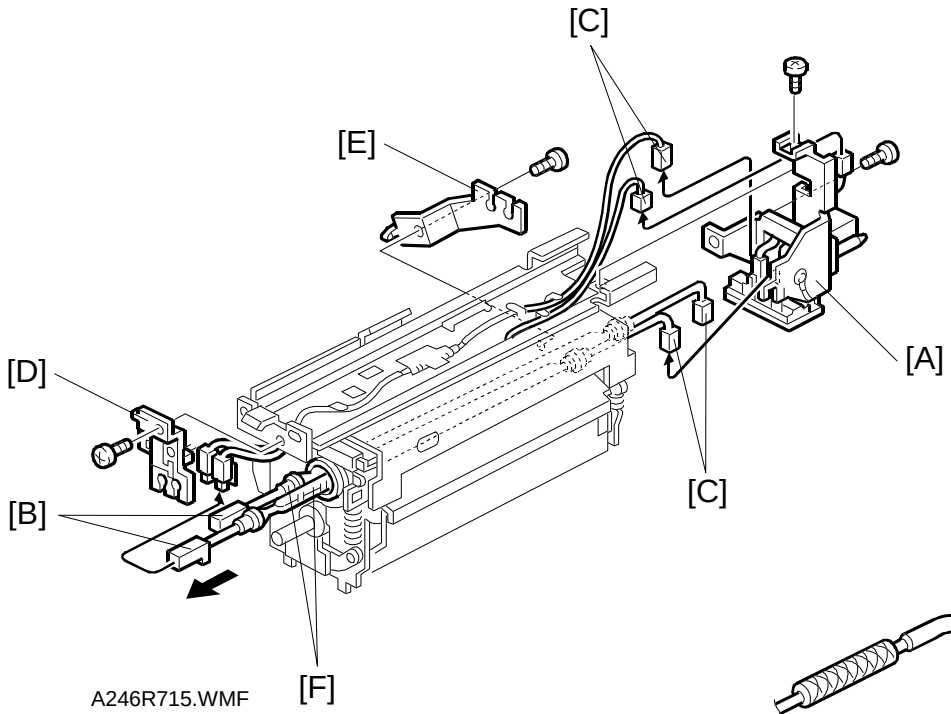
6.8.3 FUSING THERMOFUSE REPLACEMENT



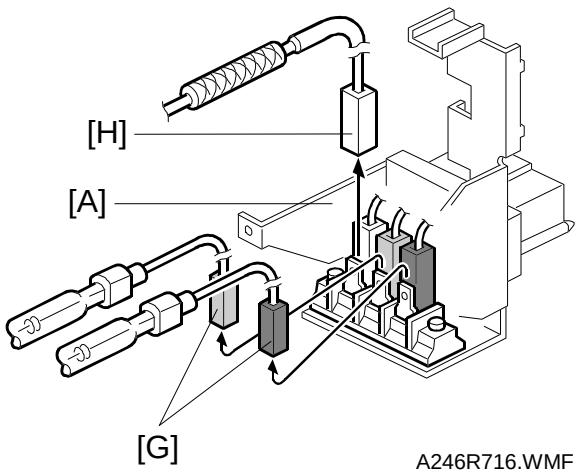
A246R646.WMF

1. Remove the fusing unit upper cover. (Refer to Fusing Thermistor Replacement, section 6.8.2.)
2. Remove the terminal bracket [A] (2 screws, 1 hook).
3. Disconnect the two connectors [B].
4. Replace the fusing thermofuse [C] (1 screw).
   NOTE: When re-assembling the fusing unit, secure the harness in the clamps correctly.

6.8.4 FUSING LAMP REPLACEMENT

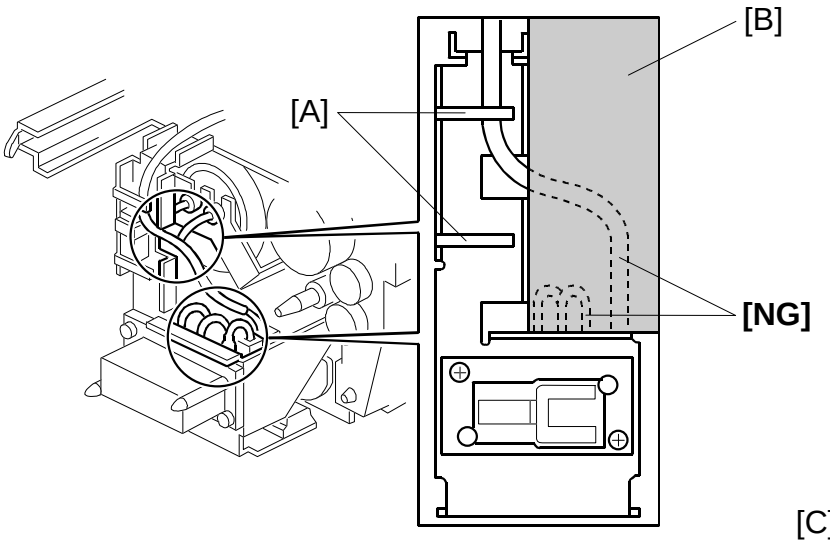


A246R715.WMF

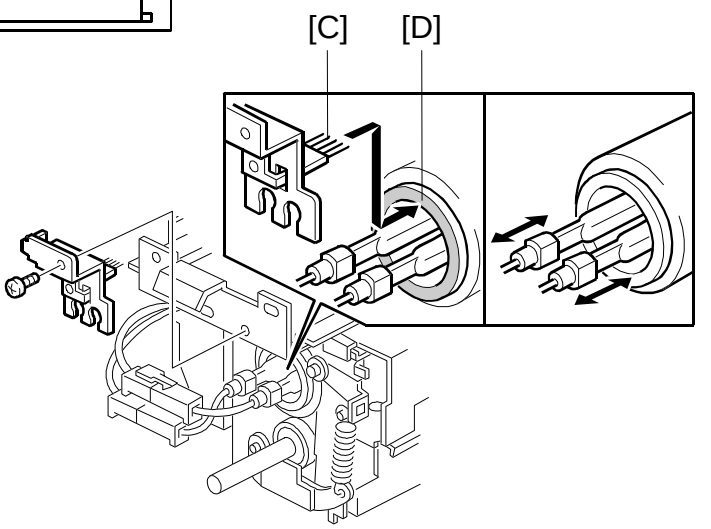


A246R716.WMF

1. Remove the fusing unit upper cover. (Refer to Fusing Unit Removal, section 6.8.2.)
2. Remove the terminal bracket [A] (2 screws).
3. Disconnect the front connectors [B] and the rear connectors [C].
4. Remove the front fusing lamp holder [D] (1 screw) and the rear fusing lamp holder [E] (1 screw).
5. Replace the fusing lamps [F].
   NOTE: At the rear terminal, make sure to connect the green connectors [G] and white connector (from the thermofuse) [H] in the correct positions on the terminal.



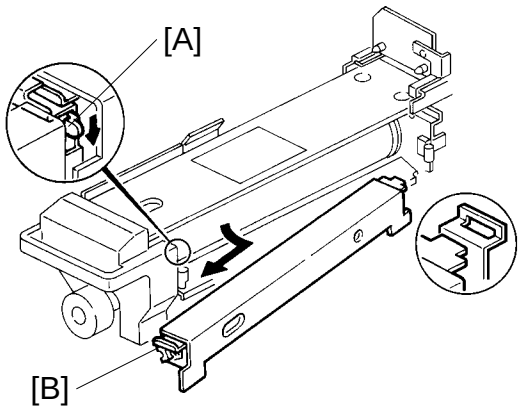
A246R717.WMF



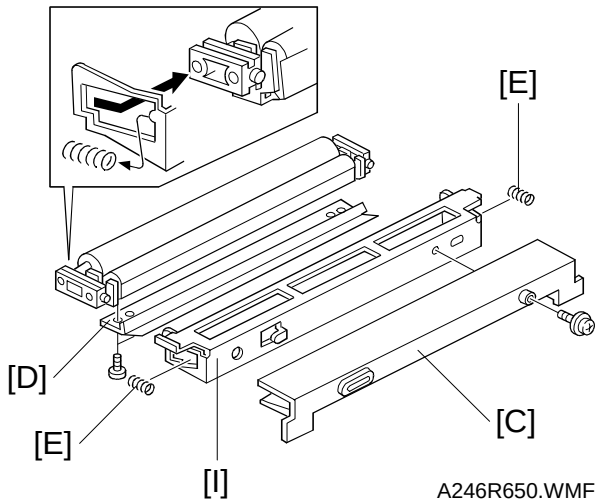
A246R718.WMF

NOTE: 1) When re-installing the thermistor, thermofuse, and lamps, secure all harnesses in the clamps [A] correctly and do not locate them in the area indicated as 'NG' [B].
2) When re-installing the lamps, check that the grounding brush [C] contacts the hot roller [D].
3) When re-installing the lamps, check that they are installed correctly, and that they can move slightly from front to rear.

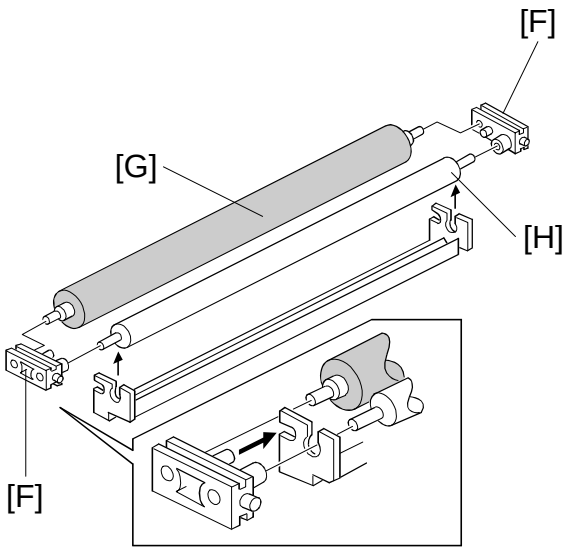
6.8.5 OIL SUPPLY/CLEANING ROLLER REPLACEMENT



A246R649.PCX



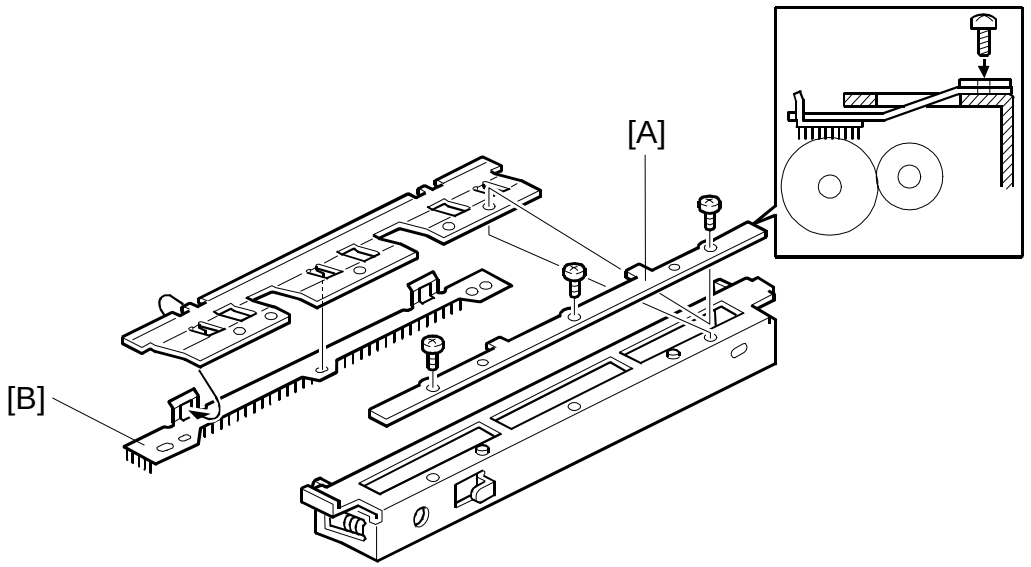
A246R650.WMF



A246R651.WMF

1. Pull out the fusing unit.
2. Lower the lever [A].
3. Remove the oil supply unit [B].
4. Remove the upper entrance guide [C] (1 screw).
5. Remove the mylar bracket [D] (2 screws).
6. Remove the springs [E].
7. Remove the bushings [F].
8. Replace the oil supply roller [G] and the cleaning roller [H].
   NOTE: Install the cleaning roller [H], oil supply roller [G] and bushing [F]. Then, install the assembled parts to the bracket [I].

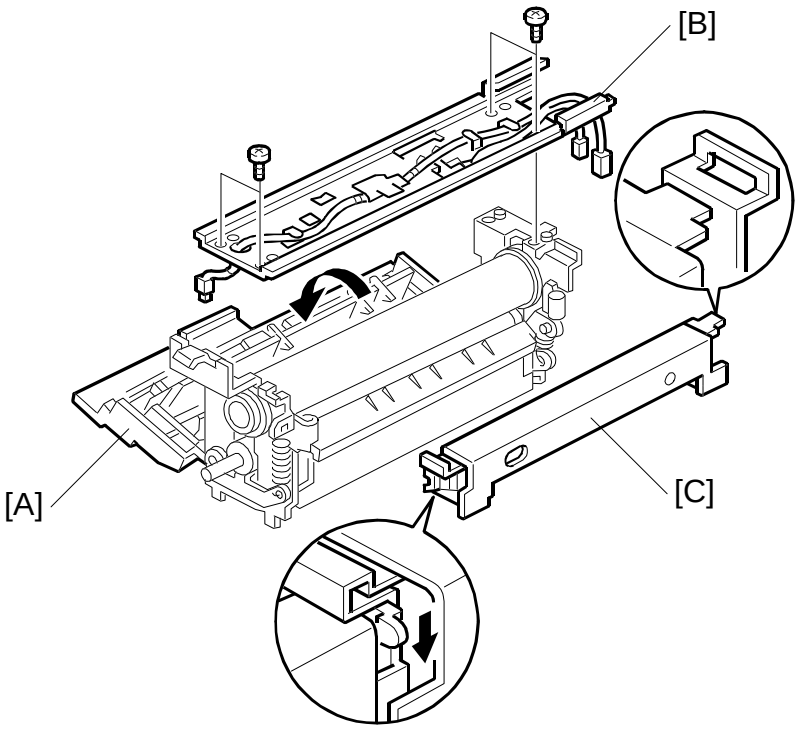
6.8.6 OIL SUPPLY CLEANING BRUSH REPLACEMENT



A246R719.WMF

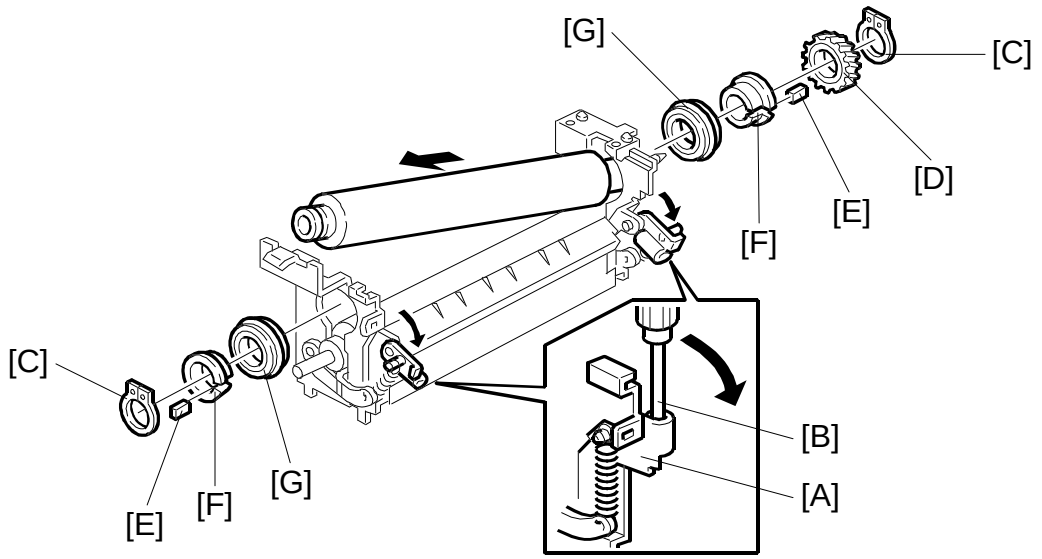
1. Perform steps 1 to 4 of Oil Supply/Cleaning Roller Replacement, section 6.8.5.
2. Remove the spring plate holder [A] (3 screws) from the oil supply roller assembly.
3. Replace the oil supply cleaning brush [B] (5 hooks).

6.8.7 HOT ROLLER REPLACEMENT



A246R652.WMF

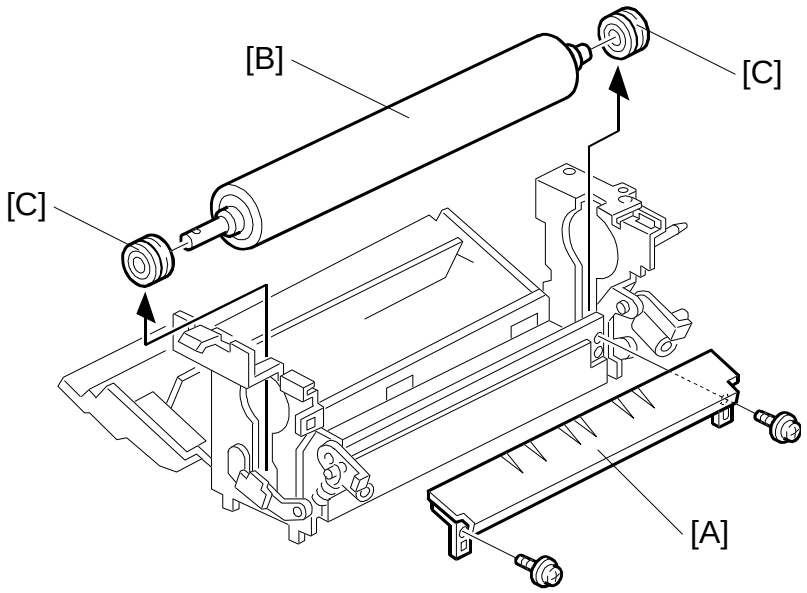
1. Remove the fusing lamps. (Refer to Fusing Lamp Replacement, section 6.8.4.)
2. Lower the fusing exit assembly [A].
3. Remove the upper stay [B] (4 screws).
4. Remove the oil supply unit [C]. (Refer to Oil Supply Roller Replacement, section 6.8.5.)



A246R653.WMF

5. Lower both side pressure spring holders [A] by using the screw driver [B] as a lever.
6. Remove the front and rear C-rings [C], gear [D], antistatic spacers [E], isolating bushings [F] and bearings [G].
   NOTE: When installing a new fusing roller:
   1) Lubricate the inner and the outer surface of the isolating bushings [F] with BARRIERTA L55/2 grease.
   2) Lubricate the fusing drive gears and their shafts with grease G501.
   3) Peel off 3 cm (1 inch) form both ends of the protective sheet, and install the hot roller.
      Before applying fusing pressure, remove the rest of the protective sheet.

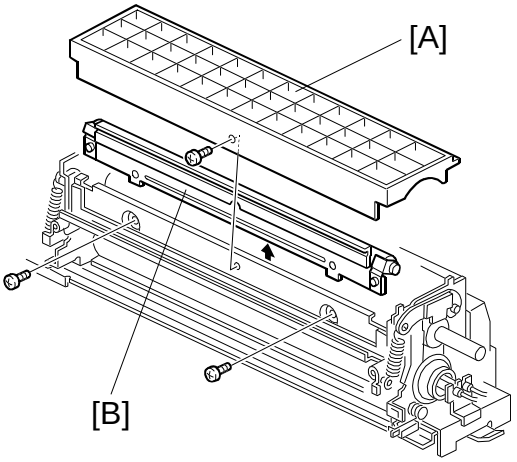
6.8.8 PRESSURE ROLLER AND BEARING REPLACEMENT



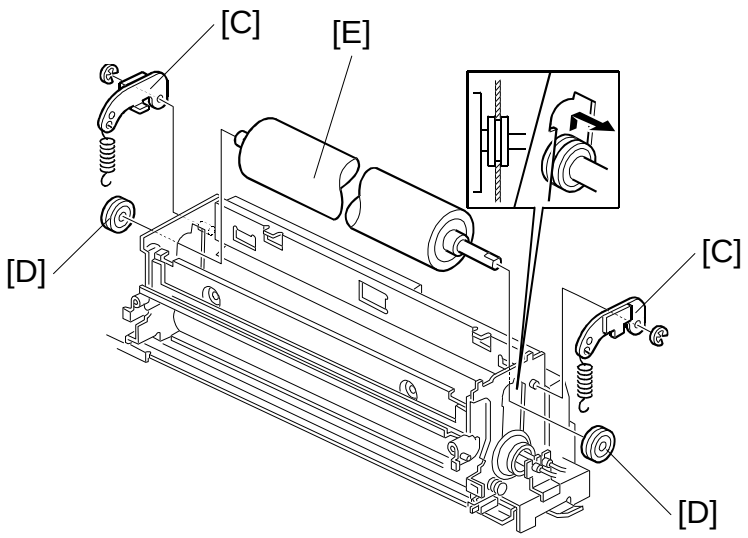
A246R654.WMF

1. Remove the hot roller. (Refer to Hot Roller Replacement, section 6.8.7.)
2. Remove the lower fusing entrance guide [A] (2 screws).
3. Lift the pressure roller [B] and remove it.
4. Replace pressure roller and bearings [C].

If replacing only pressure roller, replace the pressure roller by following procedure.



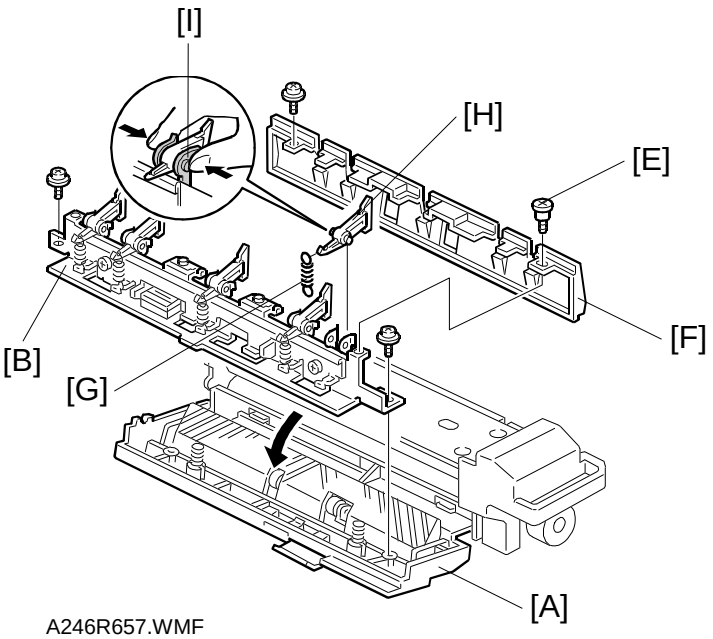
A246R655.WMF



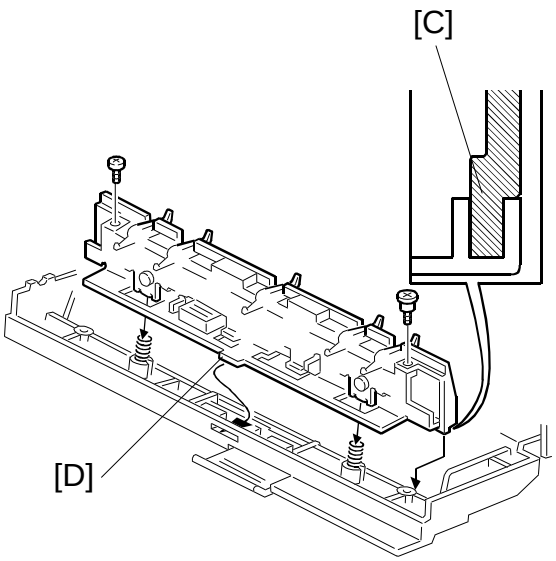
A246R656.WMF

1. Remove the fusing front cover. (Refer to Fusing Thermistor Replacement, section 6.8.2.)
2. Remove the oil supply unit. (Refer to Oil Supply Roller Replacement, section 6.8.5.)
3. Reverse the fusing unit up side down.
4. Remove the lower cover [A] (1 screw).
5. Remove the pressure roller cleaning roller unit [B] (2 screws).
6. Release the pressure levers [C] and remove them (2 E-rings).
7. Remove the bearings [D].
   NOTE: When reinstalling the bearings, meet their ditches to the bracket, as shown.
8. Replace the pressure roller [E].
   NOTE: When re-assembling, be careful not to be damaged the pressure roller by the bracket.

6.8.9 FUSING STRIPPER PAWL REPLACEMENT



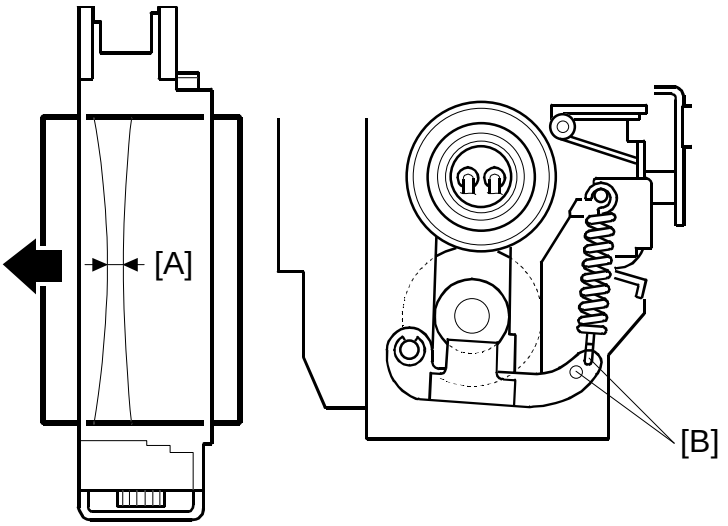
A246R657.WMF



A246R658.WMF

1. Turn off the main switch and pull out the fusing unit.
2. Lower the fusing exit assembly [A].
3. Remove the fusing stripper pawl unit [B] (2 screws).
   NOTE: When re-installing the fusing stripper pawl unit, set the projections [C, D] to the holes, as shown.
4. Remove the two screws (the front screw [E] is a stepped screw) securing the upper exit guide [F].
5. Remove the upper exit guide.
6. Unhook the springs [G] then replace the strippers [H].
   NOTE: After setting the fusing stripper pawls, confirm that the strippers are correctly held by the stripper holders [I], as shown.

6.8.10 FUSING PRESSURE ADJUSTMENT



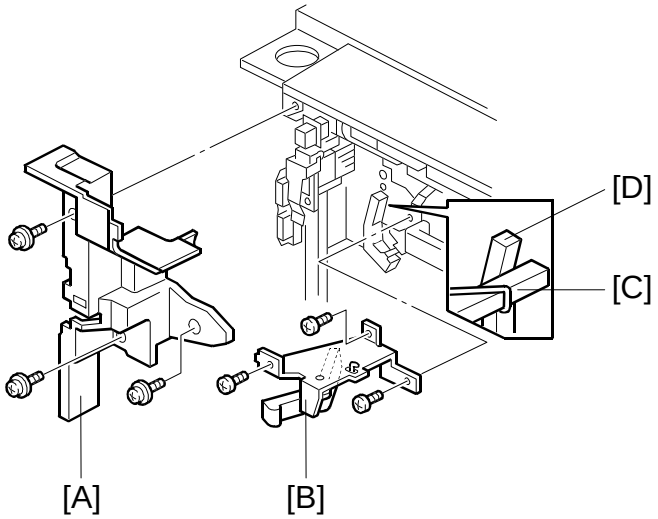
A246R660.WMF

NIP BAND WIDTH ADJUSTMENT STANDARD: 8.1 ± 0.8 mm (A246), 10.0 ± 0.5 (A247/A248)

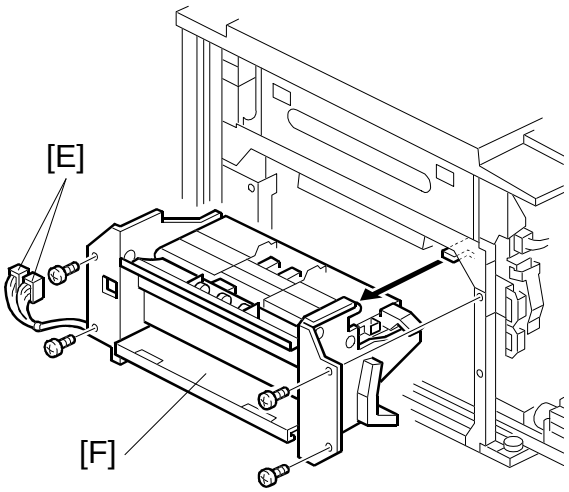
1. Make a black copy (sky shot, A3/Double Letter paper).
2. As soon as the paper starts to exit, open the front door to stop the paper in the fusing unit.
3. Wait about 20 seconds, then turn the fusing knob quickly to deliver the paper.
4. Measure the nip band width [A] at the center.
5. If the nip band width is not within 8.1 ± 0.8 mm or 10.0 ± 0.5 mm, change the spring hook position [B].

NOTE: Changing the spring position to the lower hole for the A247/A248 copier may deform the fusing unit side plate. Normally, do not change the position.

6.8.11 PAPER EXIT UNIT REMOVAL



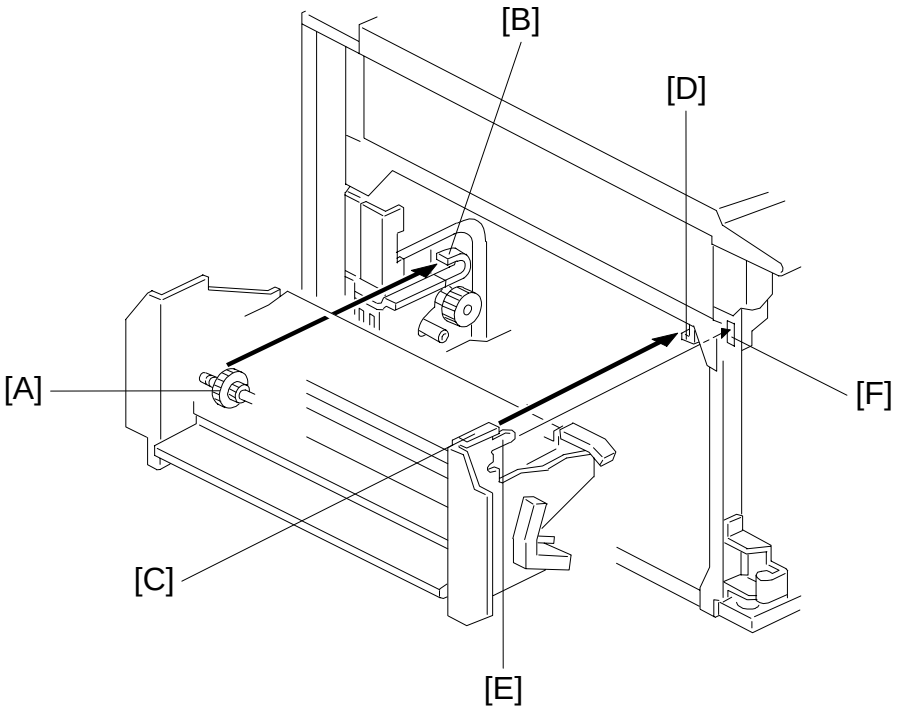
A246R661.WMF



A246R662.WMF

1. Remove the upper left cover. (Refer to Upper Left Cover Removal, section 6.1.5.)
2. Remove the left inner cover [A]. (Refer to Left Inner Cover Removal, section 6.1.3.)
3. Remove the lever bracket [B] (3 screws).
   NOTE: When reinstalling the lever bracket, install the lever [C] of the lever bracket to the right of the lever [D]. And check that the lever [D] is moved by opening the front cover.
4. While releasing the lever [D], pull out the duplex unit.
5. Disconnect the connectors [E].
6. Remove the paper exit unit [F] (4 screws).
   NOTE: Place the paper exit unit so that the paper exit roller comes to the bottom to prevent the brush roller from being pressed and damaged.

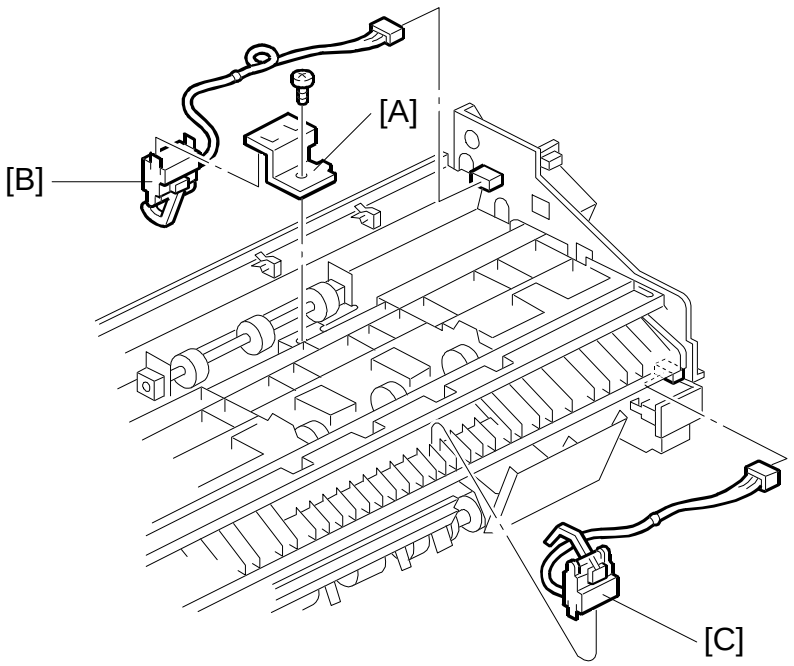
Installation



A246R663.WMF

1. Set the paper exit unit in the following order:
   1) Set the drive shaft [A] on the left rail [B].
   2) Set the plate [C] on the right rail [D].
   3) Set the positioning pin [E] in the hole [F].
2. Install the paper exit unit (2 connectors, 4 screws).
3. Re-assemble the copier.

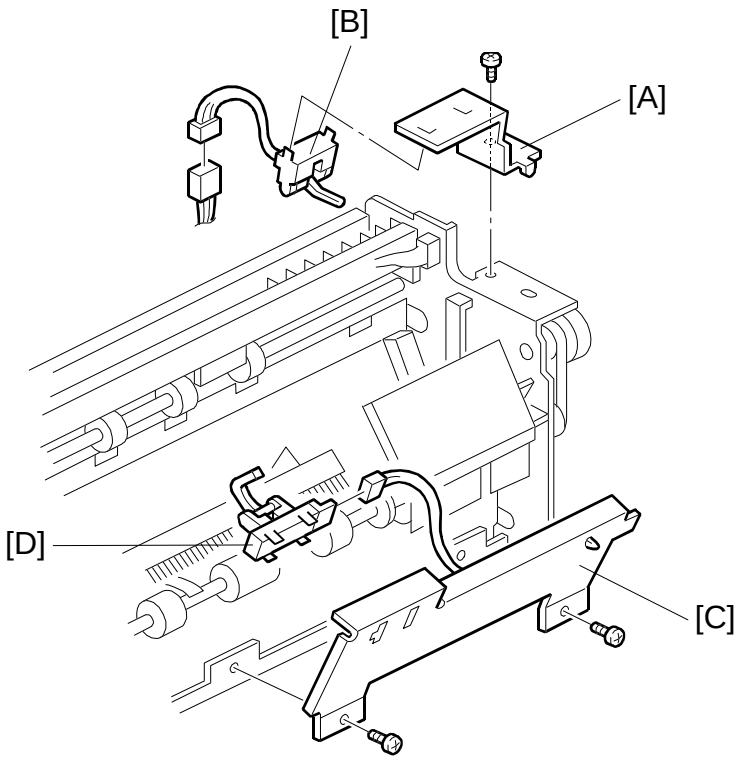
6.8.12 EXIT SENSOR AND FUSING EXIT SENSOR REPLACEMENT



A246R664.WMF

1. Remove the paper exit unit. (Refer to Paper Exit Unit Removal, section 6.8.11.)
2. Remove the exit sensor bracket [A] with the exit sensor [B] (1 screw, 1 connector).
3. Replace the exit sensor.
4. Replace the fusing exit sensor [C] (1 connector).

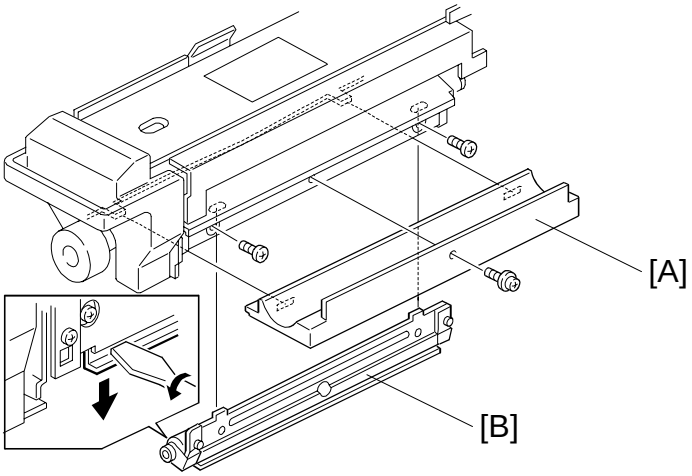
6.8.13 DUPLEX PAPER GUIDE SENSOR AND DUPLEX TRANSPORT SENSOR REPLACEMENT



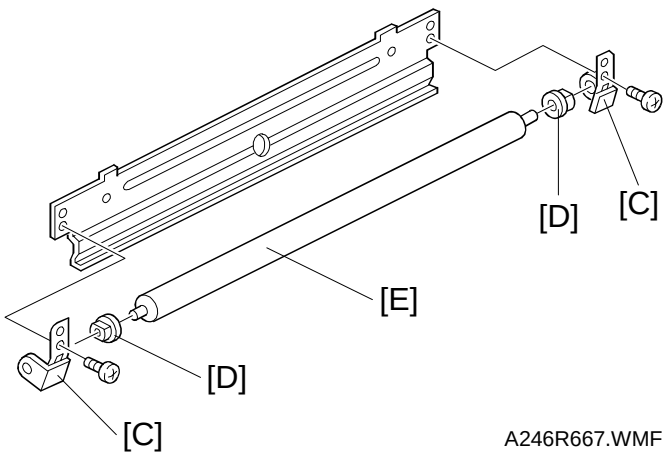
A246R665.WMF

1. Remove the paper exit unit. (Refer to Paper Exit Unit Removal, section 6.8.11.)
2. Remove the duplex paper guide sensor bracket [A] with the duplex paper guide sensor [B] (1 screw, 1 connector).
3. Replace the duplex paper guide sensor.
4. Remove the duplex transport sensor bracket [C] with the duplex transport sensor [D] (2 screws, 1 connector).
5. Replace the duplex transport sensor.

6.8.14 PRESSURE ROLLER CLEANING ROLLER REPLACEMENT



A246R666.WMF

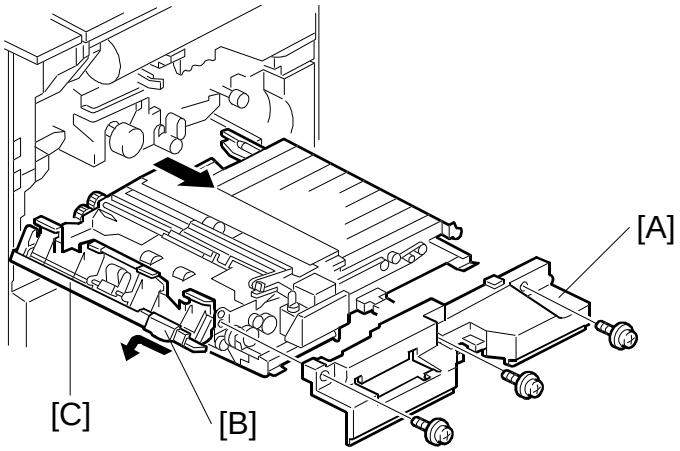


A246R667.WMF

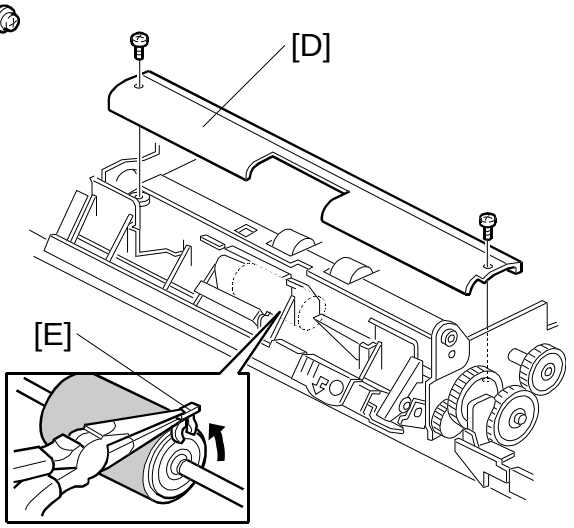
1. Pull out the fusing unit.
2. Remove the bottom plate [A] (1 screw).
3. Remove the cleaning roller unit [B] (2 screws).
4. Remove the brackets [C] (1 screw each).
5. Remove the bushings [D].
6. Replace the cleaning roller [E].
7. Re-assemble the unit.

6.9 DUPLEX UNIT

6.9.1 FEED ROLLER REPLACEMENT

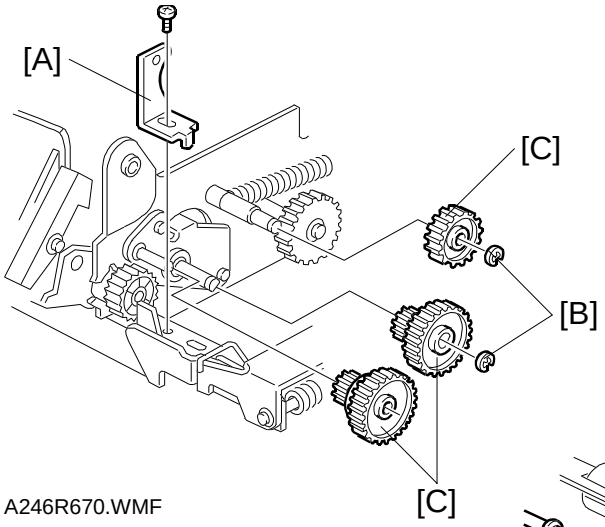


A246R668.WMF

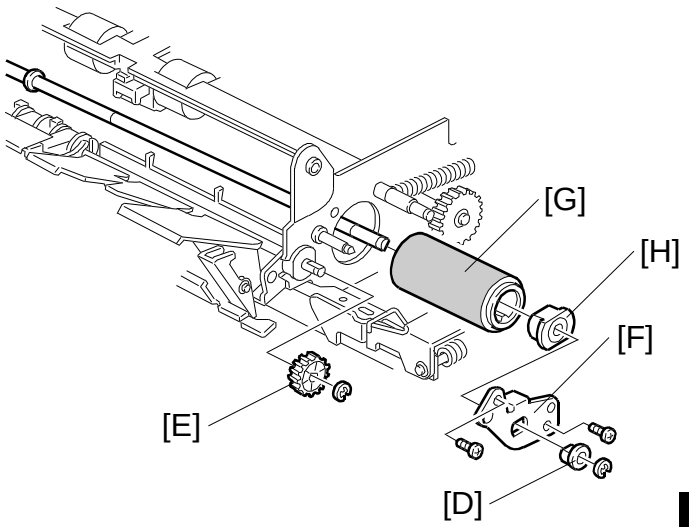


A246R669.WMF

1. Remove the duplex inner cover [A]. (Refer to Duplex Inner Cover Removal, section 6.1.3.)
2. Slide the lever [B] to the rear then open the duplex reverse assembly [C].
3. Remove the lower separation guide plate [D] (2 screws).
4. Remove the snap ring [E].



A246R670.WMF

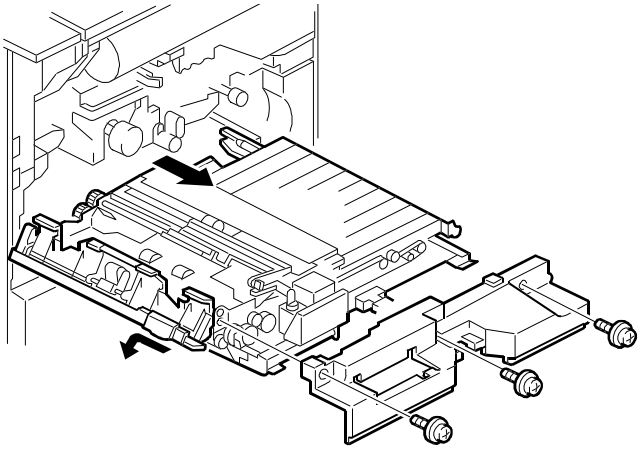


A246R671.WMF

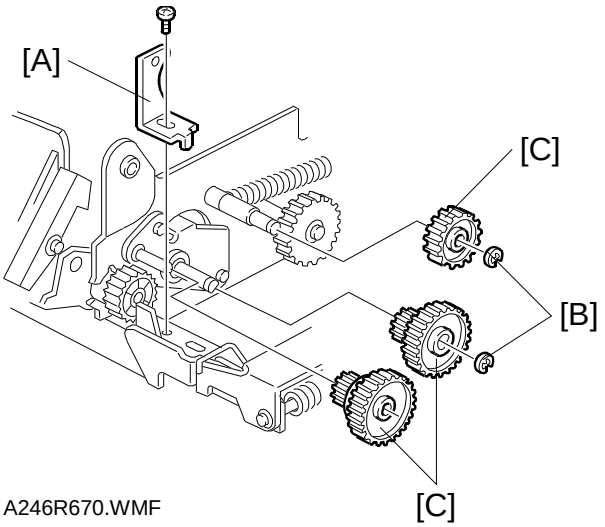
5. Remove the bracket [A] (1 screw).
6. Remove the E-rings [B] and remove the gears [C].
7. Remove the bushing [D] (1 E-ring).
8. Remove the gear [E] (1 E-ring).
9. Remove the bracket [F] (2 screws).
10. Slide the feed roller [G] to the front and replace it.

NOTE: Set the one-way clutch [H] to the machine front side when assembling.

6.9.2 SEPARATION BELT REPLACEMENT

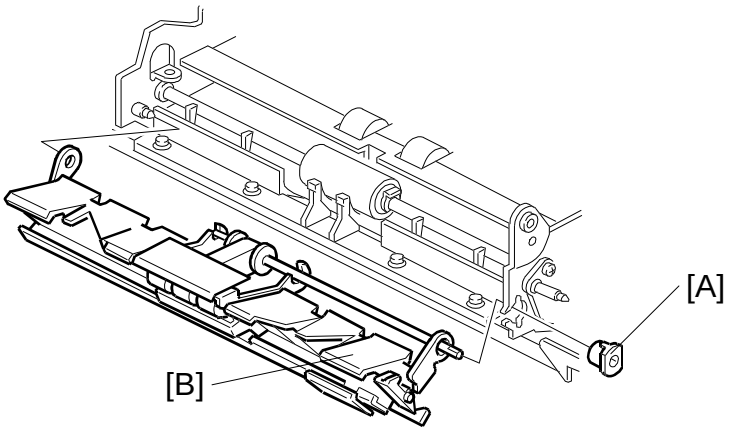


A246R668.WMF

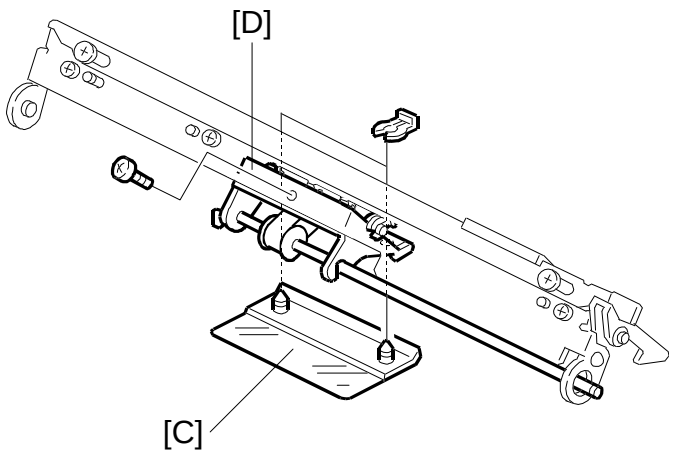


A246R670.WMF

1. Follow step 1 to 3 of the duplex feed roller replacement.
2. Remove the bracket [A] (1 screw).
3. Remove the E-rings [B] and remove the gears [C].

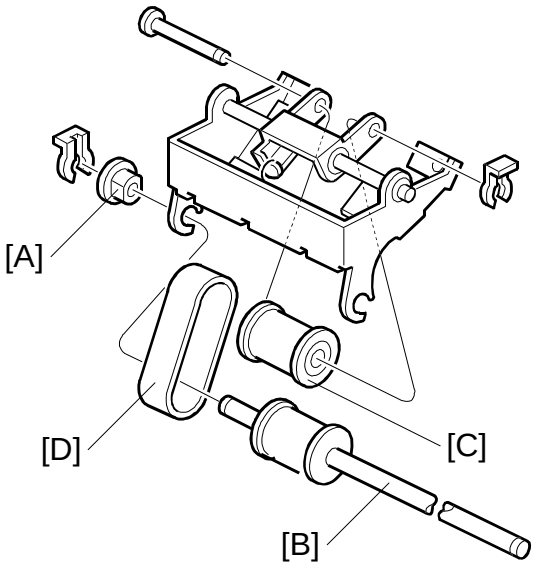


A246R674.WMF

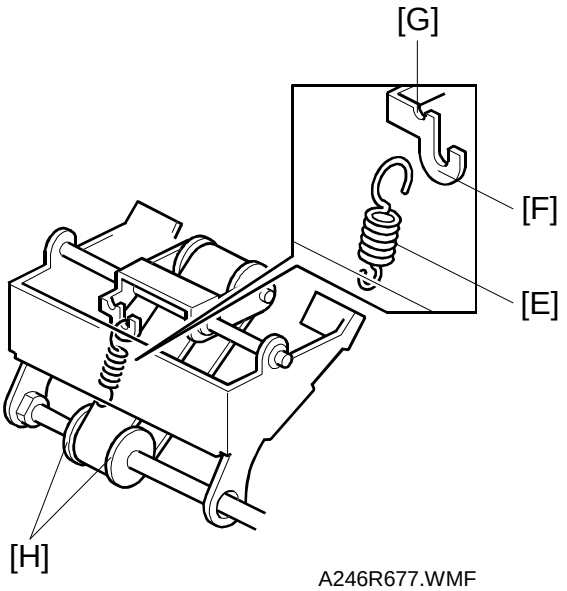


A246R675.WMF

4. Remove the bushing [A].
5. Remove the separation belt unit [B].
6. Remove the guide mylar [C] (2 snap rings).
7. Remove the belt assembly [D] (1 screw).



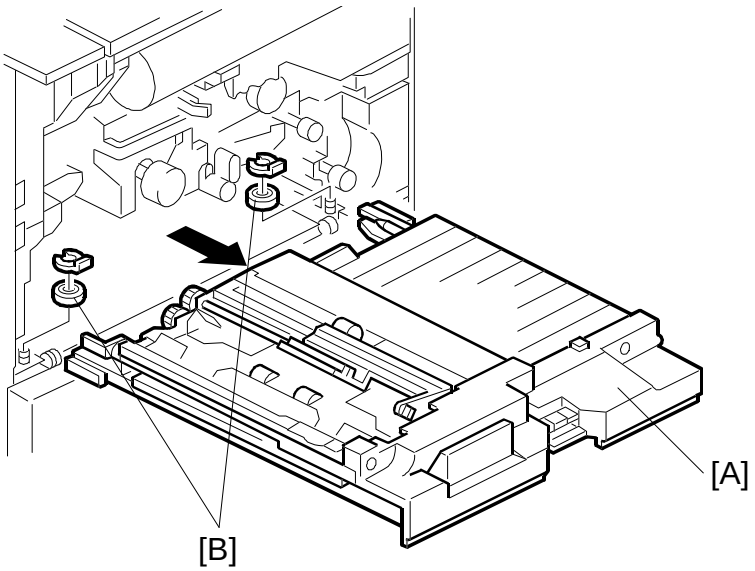
A246R676.WMF



A246R677.WMF

8. Remove the bushing [A] (1 snap ring).
9. Remove the drive roller shaft [B].
10. Remove the drive roller [C] (1 snap ring).
11. Replace the separation belt [D].
    NOTE: When setting the tension spring [E], set it on the hook [F] normally. The hook [G] applies higher separation pressure. Confirm that the separation belt is correctly set between the guides [H].

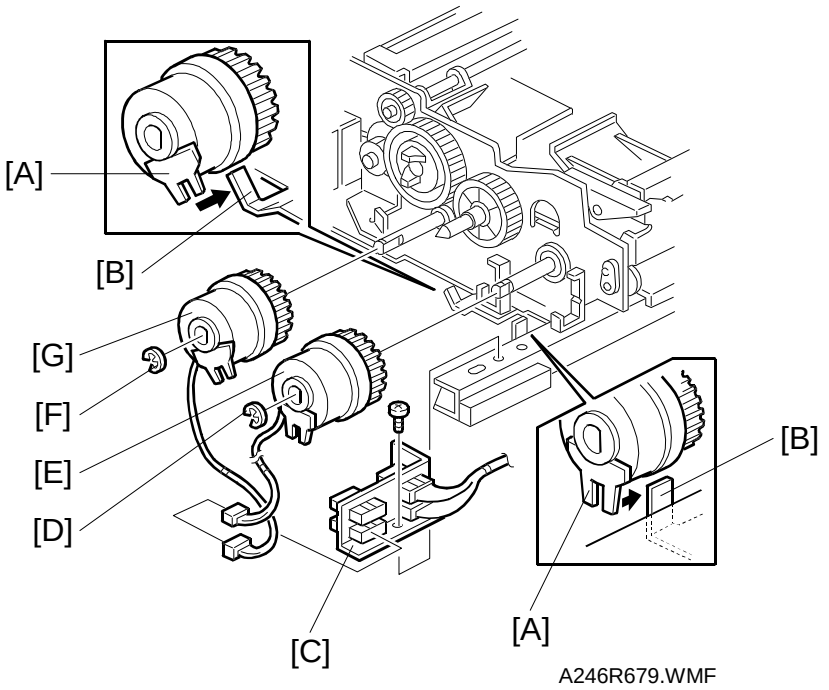
6.9.3 DUPLEX UNIT REMOVAL



A246R678.WMF

1. Open the front cover.
2. Pull out the duplex unit [A] until the stop position.
3. Remove the right and left stopper pulleys [B] (1 snap ring each).
4. Remove the duplex unit.

6.9.4 SEPARATION CLUTCH/TRANSPORT CLUTCH REMOVAL



Before replacing both clutches, take out the duplex unit. (Refer to Duplex Unit Removal.)

NOTE: When installing both clutches, be sure to set the stopper [A] to the projection [B].

Separation Clutch

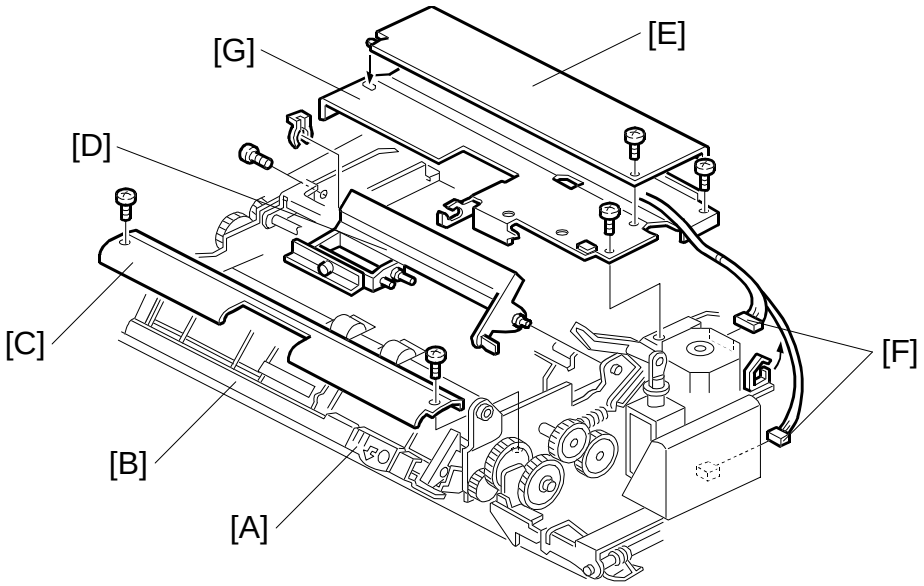
1. Remove the harness bracket [C] (1 screw).
2. Remove the E-ring [D].
3. Replace the separation clutch [E].

Transport Clutch

1. Remove the E-ring [F].
2. Replace the transport clutch [G].

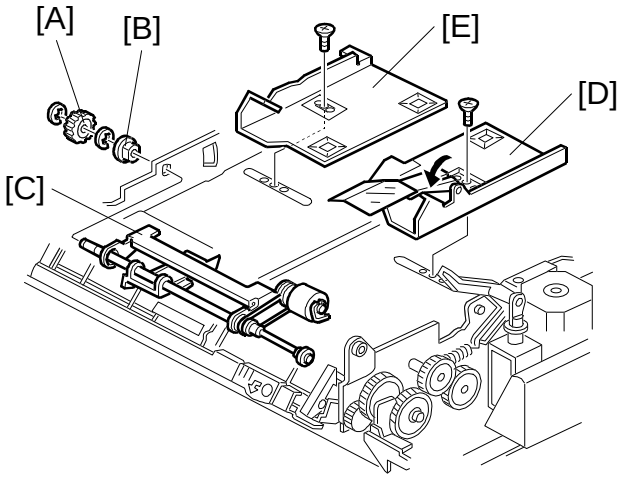
NOTE: When reinstalling the clutches, secure the harnesses in the clump.

6.9.5 JOGGER MOTOR REPLACEMENT

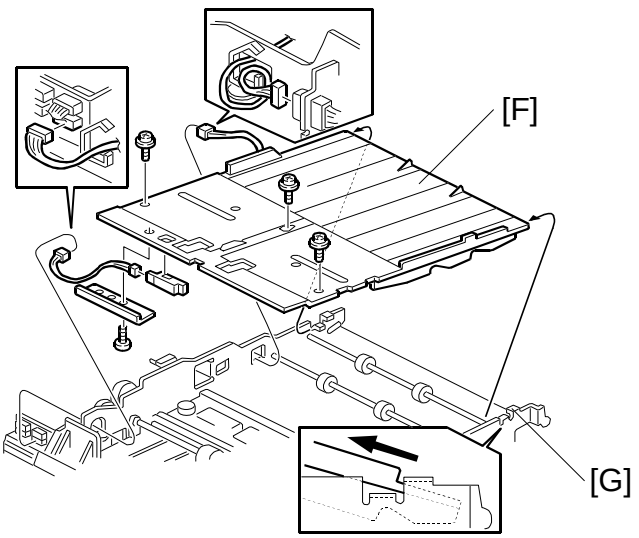


A246R680.WMF

1. Pull out the duplex unit. (Refer to the duplex unit removal, section 6.9.3.)
2. Remove the duplex inner cover (3 screws).
3. Slide the lever [A] to the rear then open the separation belt unit [B].
4. Remove the lower separation guide plate [C] (2 screws).
5. Remove the pressure arm [D] (1 snap-ring).
6. Remove the harness cover [E] (1 screw).
7. Disconnect the two connectors [F].
8. Remove the upper stay [G] (4 screws).

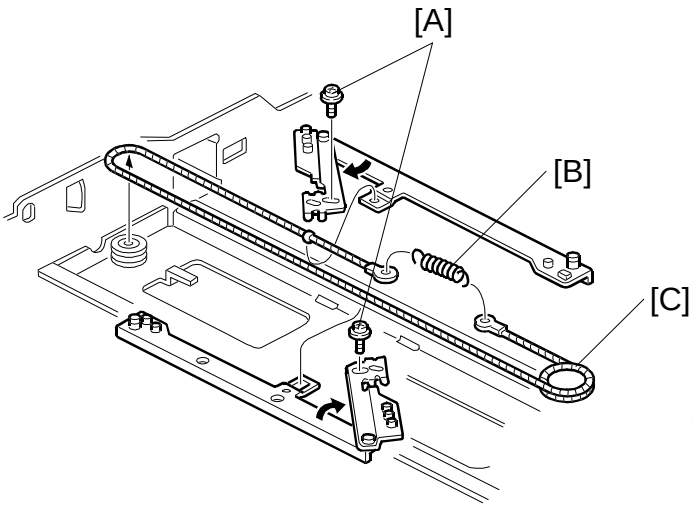


A246R681.WMF

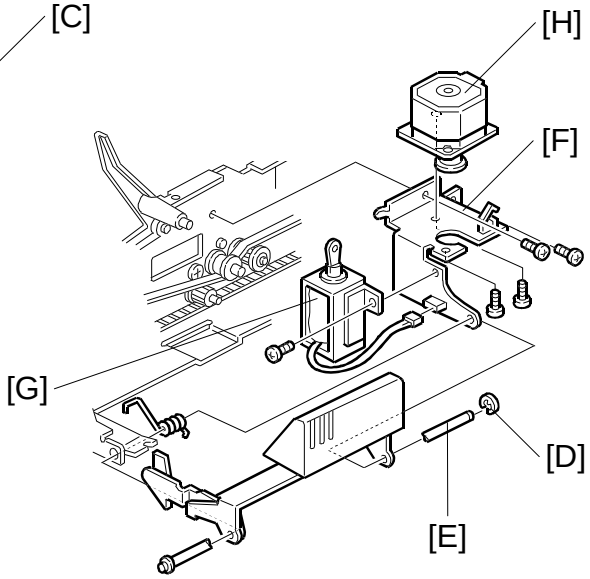


A246R682.WMF

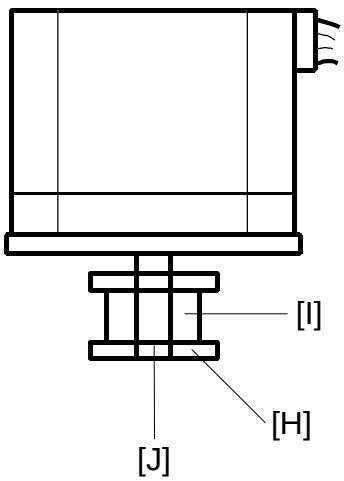
9. Remove the positioning roller drive gear [A] (1 E-ring).
10. Remove the bushing [B] (1 E-ring).
11. Remove the positioning roller assembly [C].
12. Remove the front jogger fence [D] and the rear jogger fence [E] (1 screw each).
13. Remove the duplex tray [F] (3 screws, 1 connector).
    NOTE: To release the hooks [G], slide the duplex tray to the upper left as shown.



A246R683.WMF

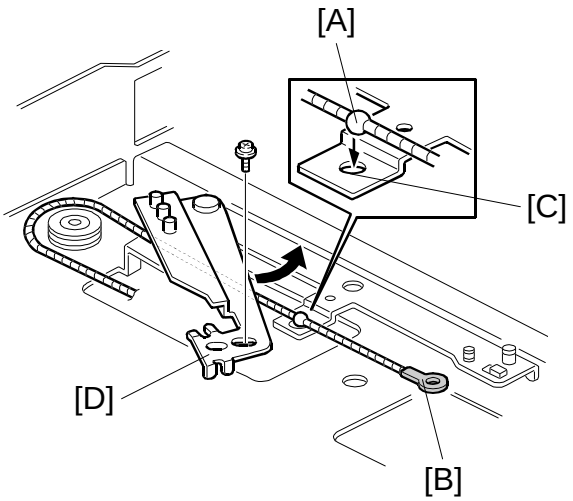


A246R684.WMF

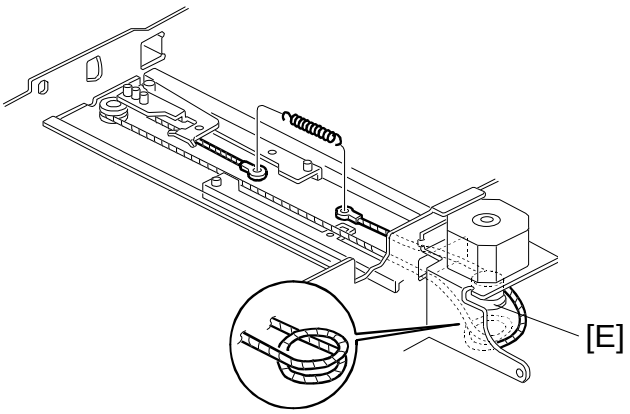


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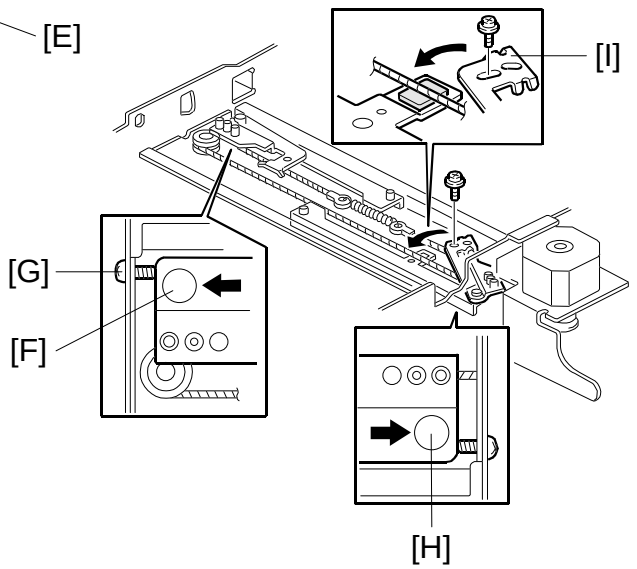
14. Remove the screws [A] securing the drive wire stoppers.
15. Unhook the tension spring [B] and remove the drive wire [C].
16. Remove the E-ring [D] and slide the shaft [E] to the left.
17. Remove the jogger motor bracket [F] (1 screw).
18. Remove the pressure arm solenoid [G] (1 screw, 1 connector).
19. Replace the jogger motor [H] (2 screws).
    NOTE: When installing the drive pulley [I] to the jogger motor shaft, align the shaft head [J] with the pulley head [H].
20. Re-assemble the duplex unit.



A246R686.WMF



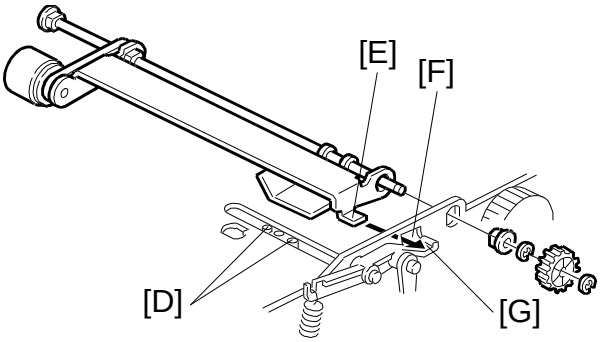
A246R687.WMF



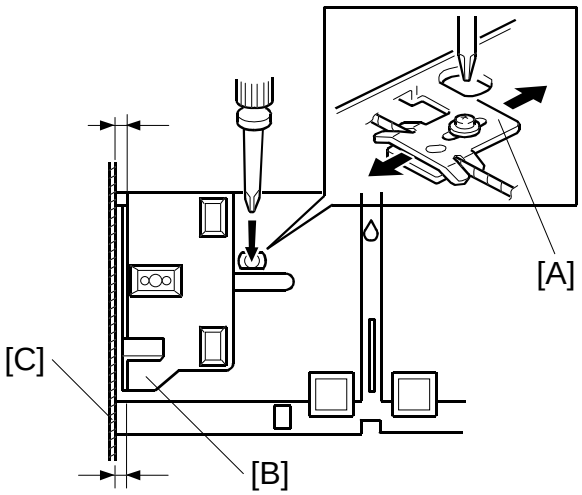
A246R688.WMF

Jogger Drive Wire Installation

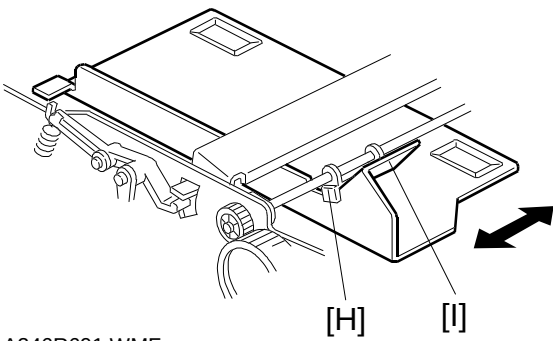
1. Set the bead [A] which is closer to the red colored hook [B] in the hole [C] and install the stopper [D] (1 screw).
2. Round the drive wire twice around the drive motor pulley [E] as shown.
3. Move the rear jogger fence bracket [F] to the rear end position (until the bracket [F] touches the screw [G]) and keep this condition.
4. Under the above condition, place the front jogger fence bracket [H] to the front end position (until the bracket [H] touches the front screw).
5. Install the stopper [I] to fix the front jogger fence bracket with the wire.



A246R689.WMF



A246R690.WMF



A246R691.WMF

NOTE: 1) Adjust the position of the stopper [A] so that the jogger fences [B] and side plate [C] are parrallel.
2) When installing the jogger fences, confirm if the two positioning pins [D] are correctly set in the two holes on the side fences after the screw is set.
3) When installing the positioning roller assembly, insert the plate [E] in the hole [F] on the rear frame, then set the plate on the lever [G].
4) When installing the rear paper press mylar, set the hook [H] to the rear jogger fence [I] as shown so that the mylar moves together with the jogger fence [I].
5) After installing the jogger fences, manually move the jogger fences [I] to confirm that they move smoothly.
6) After re-assembling the duplex unit, manually pull the plungers of the positioning roller solenoid and the pressure arm solenoid to confirm that the positioning roller assembly and the pressure arm move up and down correctly.
7) After re-assembling the duplex unit, adjust the jogger fence width so that the distance between both side fences become 1 mm wider than the paper size, when paper is set on the duplex tray (SP1-7-1 “Jogger Span Adjustment”).

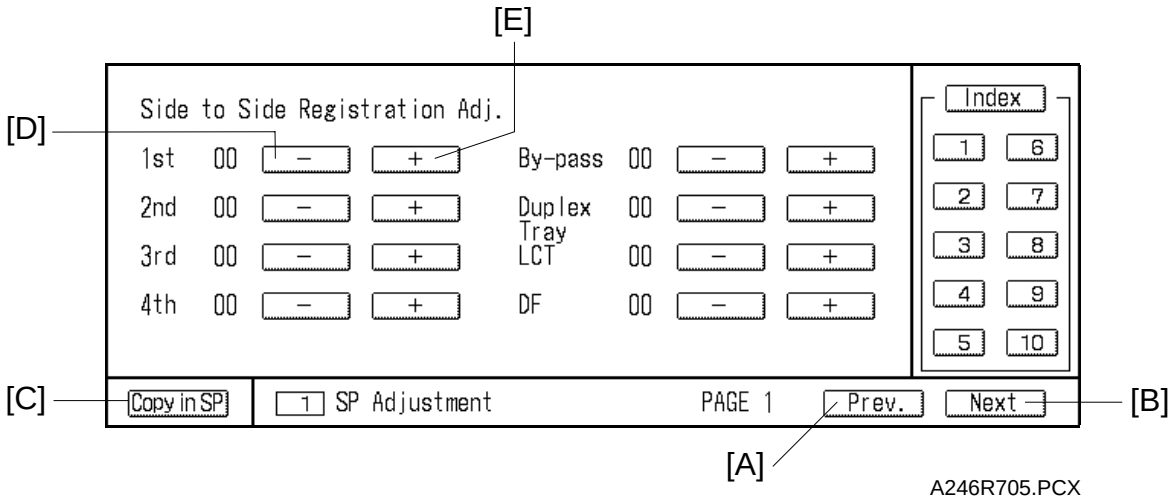
6.10 COPY QUALITY ADJUSTMENT

6.10.1 SP ADJUSTMENT MODE

The copy quality adjustments in the table below can be performed by using the appropriate SP Adjustment mode.

Item	SP Mode No.	Standard	Change Amount/1 step	Default
Side to side registration	1-1-1	0 ± 2 mm	0.1 mm	00
Leading edge registration	1-2-3	0 ± 2 mm	0.5 mm	00
Leading edge erase margin	1-2-4	3.5 ± 2.5 mm	0.5 mm	00
Vertical magnification	1-3-1	100 ± 1%	0.1%	00
Horizontal magnification	1-3-2	100 ± 0.5%	0.1%	00
Focus in enlarge/reduce (Lens error correction)	1-3-3	—	0.1%	00
Focus in full size	1-3-4	—	0.1%	00

NOTE: When performing multiple adjustments, perform the items in order from top to bottom.
Perform each adjustment as explained in the next pages.



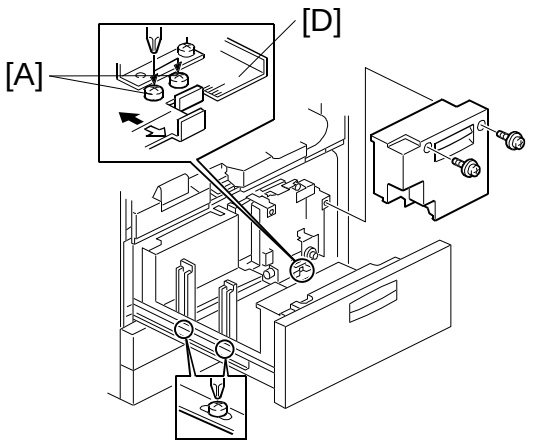
A246R705.PCX

1. Enter SP mode (refer to Service Program Access Procedure) and access SP Adjustment mode.
2. Access the appropriate page by touching the “Prev.” [A] or “Next” [B] key.
3. Touch the “Copy in SP” key [C] then select the proper copy mode.
4. Make a copy of the OS-A3 chart.
5. Confirm if copy quality is within the adjustment standard.
6. If the copy quality is not correct, touch the “SP Mode” key at the left upper corner of the LCD panel.
7. Touch the “–” key [D] or the “+” key [E] to change the data, then repeat steps 3 to 6 until the copy quality becomes within the adjustment standard.
8. Exit the SP mode.

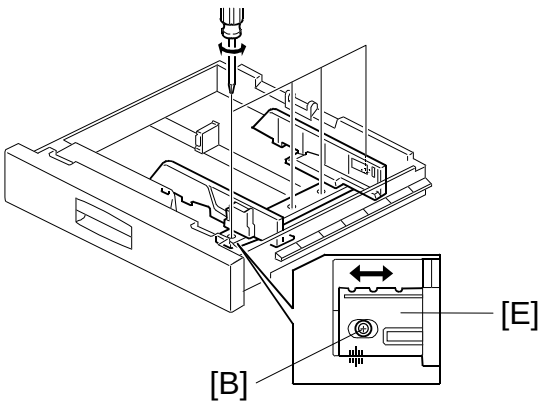
6.10.2 SIDE-TO-SIDE REGISTRATION ADJUSTMENT

If the side-to-side image registration for paper fed from the duplex tray should be adjusted, follow the entire procedure below.

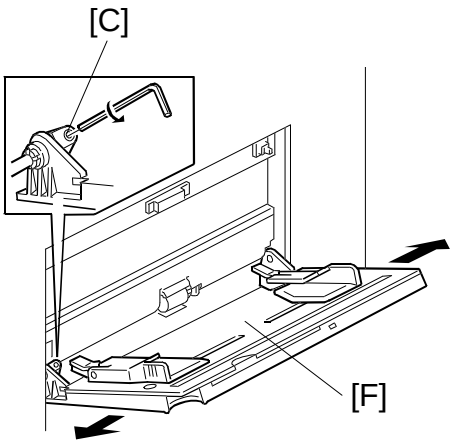
If the side-to-side registration for duplex tray feed does not need to be adjusted but side-to-side registration for the paper feed tray should be adjusted, follow only steps 4 and 5 of the procedure below.



A246R692.WMF



A246R694.WMF

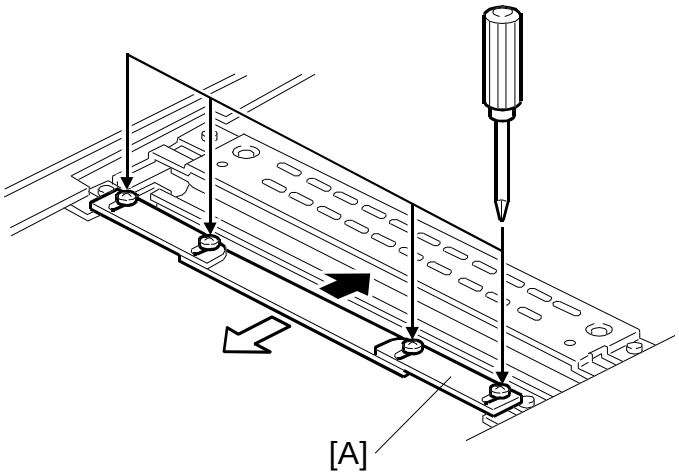


A246R693.WMF

1. Enter SP mode (refer to the service program access procedure) and access the side-to-side registration adjustment mode (SP1-1-1).
2. Adjust side-to-side registration for the duplex tray by changing the SP mode data.
   NOTE: Copies can be made in SP mode. Touch “Copy in SP” key to select the paper feed station.
   Adjustment standard: Less than ± 2 mm difference between original and copy.
3. Change the SP data of each paper feed tray so that it is the same as the SP data of the duplex tray.
4. Loosen the screws [A] for the tandem LCT tray [B] for 550-sheets fixed tray or for universal tray, or [C] for by-pass feed tray.
5. Reposition the tray by moving parts [D, E] and [F] of the trays.

6.10.3 UNEVEN EXPOSURE ADJUSTMENT

When:	If the exposure is uneven.
Purpose:	To maintain even exposure.
Adjustment standard:	The side-to-side variation of the gray scales on the test chart should be less than one level.
How:	Change the position of the exposure lamp or exposure adjustment wings to make light intensity from the exposure lamp even across its length.



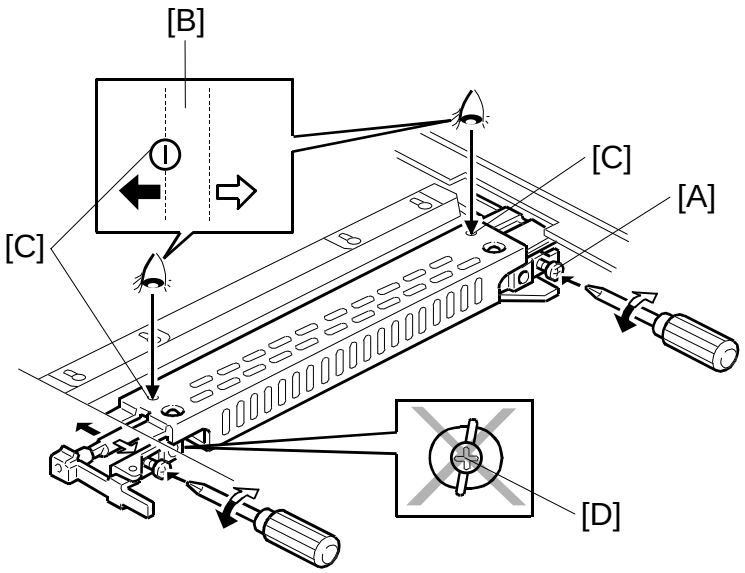
A246R695.WMF

Wing positioning:

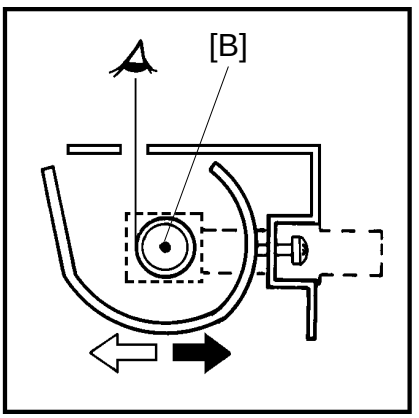
Image turns darker.

Image turns lighter.

1. Remove the exposure glass. (Refer to Exposure Glass Removal, section 6.3.1.)
2. Position the adjustment wings [A] so that the side-to-side copy image density variation is within the adjustment standard.
3. Turn on the main switch and enter SP mode, then perform the Process Control Data Initial Setting (SP1-2-2).
   NOTE: If uneven density is not solved by this adjustment, proceed to the steps 4 and 5 in the next page.



A246R697.WMF



A246R696.PCX

4. Turn the screw [A] to correct the position of the filament. The left edge of the exposure lamp [B] should be directly beneath the center of the sight hole [C] in the reflector cover.

CAUTION: Do not touch the screw [D].

5. Turn on the main switch and enter SP mode, then perform the Process Control Data Initial Setting (SP1-2-2).

6.10.4 IMAGE DENSITY ADJUSTMENT

When: The copy image density is already adjusted to the standard level at the factory, and process control maintains copy image density until the next PM. If the customer asks you to adjust the image density, it can be done by using the User Tool mode.

Purpose: To adjust the copy image density.

How: The User Tool “image density level’ mode changes the development bias voltage.

1. Enter User Tool mode and access “7 Image reproduction setting” modes.
2. Select the appropriate image density level (7 steps).

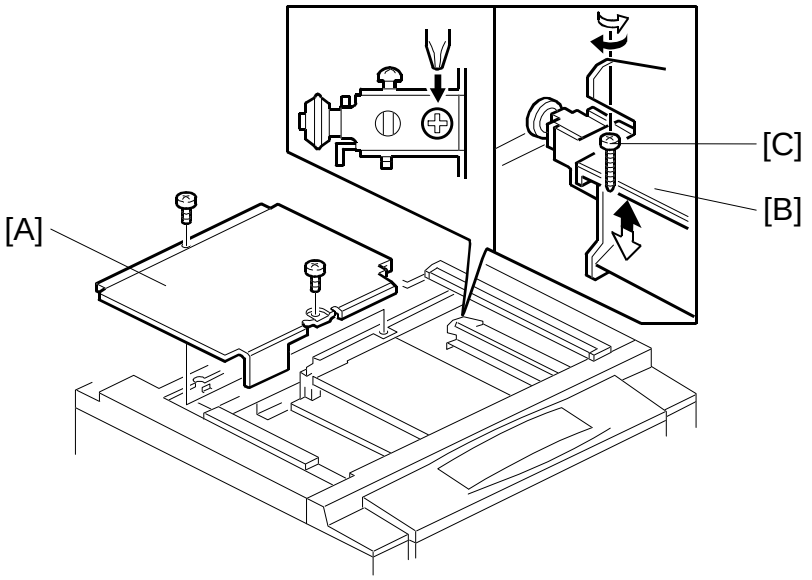
   Adjustment: Press the appropriate ID level key.
3. Press the “Exit” key to exit User Tool mode.
4. Check copy quality.

6.10.5 SCANNER HEIGHT ADJUSTMENT

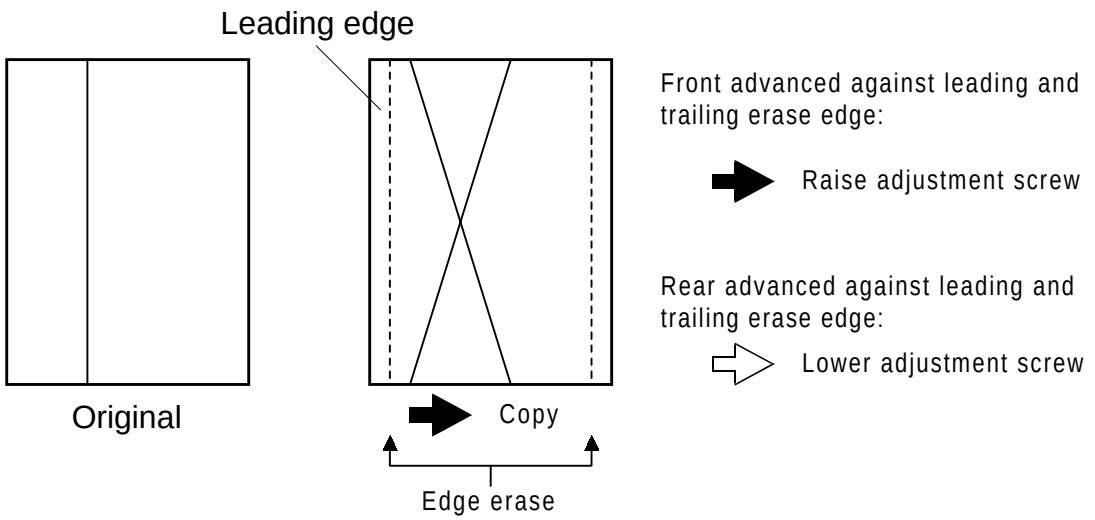
When: If optically skewed images appear after adjusting the 1st and 2nd scanner positions.

Purpose: To maintain a proper copy image.

How: Turn the 3rd scanner height adjusting cam.
This changes the 3rd scanner's height.



A246R672.WMF



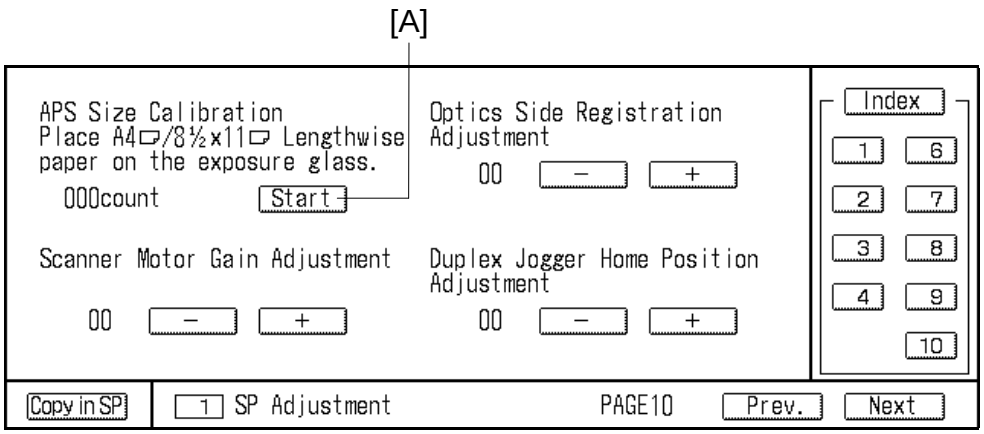
1. Remove the exposure glass.
2. Remove the lens unit cover [A] (2 screws).
3. Adjust the 3rd scanner [B] height by the adjustment screw [C].

6.10.6 APS SIZE CALIBRATION

When: When replacing the APS sensor.
When removing the APS sensor.
If proper paper size can not be detected.

Purpose: To function the APS sensor accurately.

How: Perform SP1-10-1 (APS Size Calibration).



A246R706.PCX

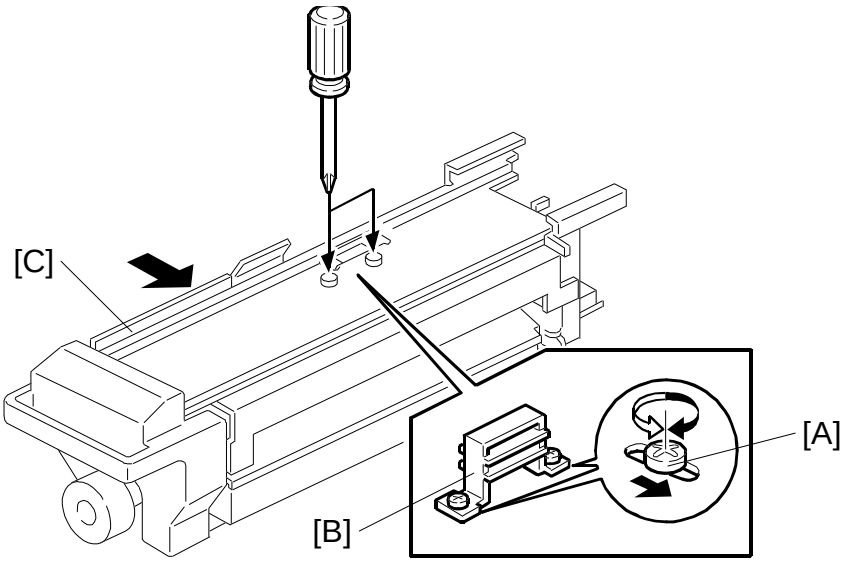
1. Enter SP1-10-1.
2. Open the ADF or the platen cover.
3. Set the A4 or LT size paper (lengthwise) and touch the “Start” key [A].
   NOTE: When touching the “Start” key, keep the ADF or platen cover open. If closing the ADF or the platen cover, APS sensor stops.

6.10.7 FUSING EXIT COVER MAGNET POSITIONING ADJUSTMENT

When: If paper jam occur in the fusing unit.

Purpose: This adjustment is required so that the fusing stripper contact with the hot roller correctly.

How: Change the position of the fusing exit cover magnet.



A246R698.WMF

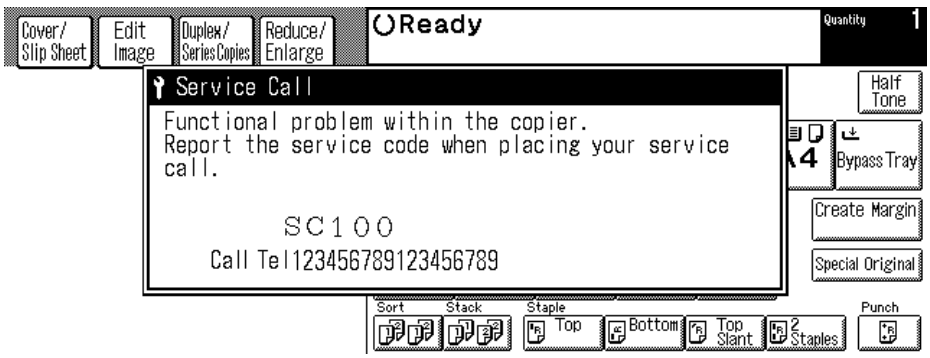
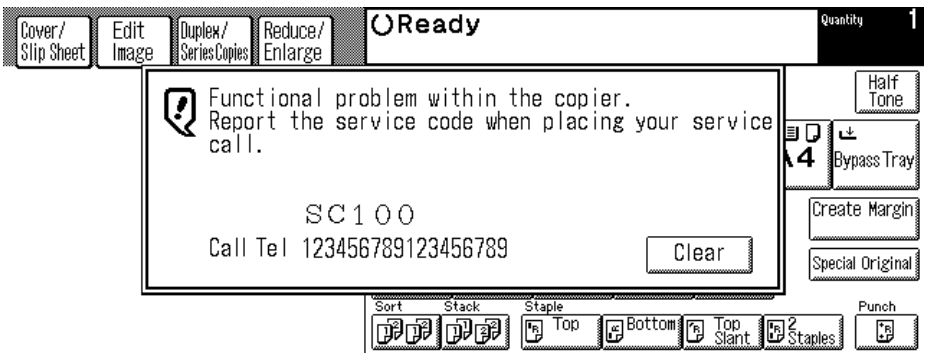
1. Remove the fusing unit upper cover (1 screw).
2. Loosen the screws [A] securing the magnet [B].
3. Push the fusing exit cover [C] and tighten the screws [A].
   NOTE: Do not push the fusing exit assembly too strong.
4. Confirm that the fusing exit assembly close firmly when pushing it. Also confirm that the fusing exit assembly easily close.

7. TROUBLESHOOTING

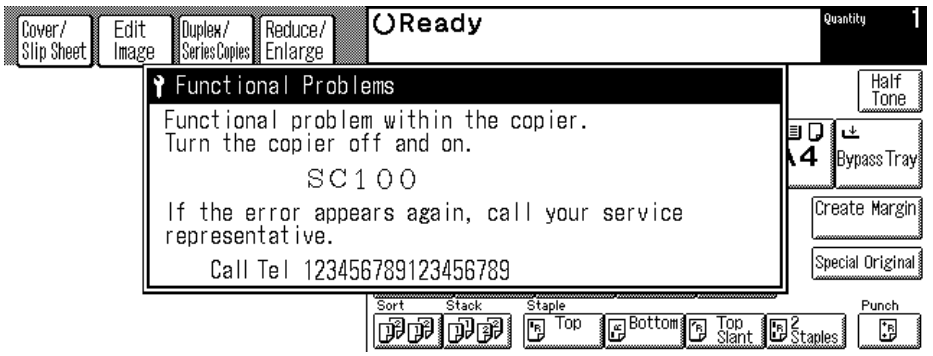
7.1 SERVICE CALL CONDITIONS

7.1.1 SUMMARY

There are 4 levels of service call conditions.

Level	Definition & Display
A	The SC can only be reset by a service representative (see the note on the next page) to prevent the machine from being damaged. The copier cannot be operated at all.  A246T501.PCX The SC display will not be canceled.
B	The copier can be operated as usual except for the unit related to the service call.  A246T502.PCX If the related function is selected, this display appears.
C	Only the SC counter is incremented. The copier can be operated as usual. The SC will not be displayed.

Level	Definition & Display
D	The SC can be reset by turning main switch off and on if the SC is caused by misdetection.



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NOTE: 1) If the problem is related to electrical circuit boards, first disconnect then reconnect the connectors before replacing the PCBs.
2) If the problem is related to motor lock, first check the mechanical load before replacing motors or sensors.
3) To reset a Level A SC, enter SP mode then turn the main switch off and on.
4) When an SC condition occurs while in SP mode, the display does not indicate the SC number. You can recognize the SC condition because in this condition, you cannot exit the SP mode by touching the “Quit” key. If this occurs, check the SC number as follows:
   a) Perform the same procedure to duplicate the SC condition.
   b) Enter “Copy in SP” mode. You can see the SC number on the display.

7.1.2 EXPOSURE

SC101 - Exposure lamp malfunction - abnormal on/off

Definition: [level: A]

1) An A/D conversion level higher than 21 is detected more than 50 times while the relay trigger is on and the lamp trigger is off.
2) An A/D conversion level lower than 6 is detected more than 50 times while the exposure lamp is on.

Possible causes

- Exposure lamp open
- Exposure lamp thermoswitch open
- Optics control board defective
- AC drive board defective

SC102 - Exposure lamp malfunction - abnormal process control

Definition: [level: A]

1) VL/VR correction not finished within 50 seconds.
2) ADS adjustment not finished within 15 seconds.

Possible cause:

- ADS sensor defective
- Drum potential sensor defective
- Main control board defective
- Optics control board defective
- AC drive board defective

SC103 - Power source frequency detection error

Definition: [level: D]

Frequencies detected out of the 45Hz to 65Hz range.

Possible causes:

- Abnormal power source
- Electrical noise
- AC drive board defective
- Optics control board defective

SC104 - Exposure lamp malfunction - abnormal off

Definition: [level: D]

The scanner start signal is received even if the main relay off condition is detected.

Possible causes:

- Main relay defective
- Communication error between the main control board and the optics control board because of a poor harness connection.
- Optics control board defective
- Electrical noise

SC105 - Zero-cross abnormal

Definition: [level: D]

1) The optics control board does not detect a zero-cross signal for more than 1 second when the main relay trigger on the optics control board is on.
2) The optics control board does not detect a zero-cross signal for more than 10 seconds when the main switch is turned on.

Possible causes:

- Main relay defective
- Optics control board defective
- AC drive board defective

7.1.3 SCANNER

SC120 - Scanner home position sensor abnormal - stays off

Definition: [level: D]

The scanner home position sensor does not detect the on condition even if the scanner returns home.

Possible causes:

- Scanner home position sensor defective
- Optics control board defective
- Scanner HP sensor short

SC121 - Scanner home position sensor abnormal - stays on

Definition: [level: D]

The scanner home position sensor does not detect the off condition even if the scanner has moved 40 mm away from the scanner home position sensor.

Possible causes:

- Scanner home position sensor defective
- Scanner motor defective
- Scanner HP sensor open
- Optics control board defective

SC124 - Scanner motor encoder abnormal

Definition: [level D]

1) The scanner motor encoder connector is disconnected.
2) The optics control board does not receive the encoder signal within 200 ms after the scanner motor starts rotating.

Possible cause:

- Scanner motor encoder defective
- Scanner motor defective
- Connector disconnected (CN514, 515, 516)

SC125 - Low scanner speed

Definition: [level: D]

1) The scanner speed, detected by the optics control board through the encoder, is lower than the specified speed.
2) When the scanner returns to the home position, it stops before reaching the home position sensor.

Possible causes:

- Scanner drive motor defective
- Optics control board defective
- Abnormal load of the scanner drive

SC126 - High scanner speed

Definition: [level: D]

The scanner overruns by more than 12 mm after passing the scanner home position.

Possible causes:

- The scanner drive motor defective
- Optics control board defective

SC127 - Scanner drive motor encoder failure

Definition: [level: D]

The scanner rotating direction detected by the optics control board through the encoder is opposite to the specified direction.

Possible causes:

- Scanner drive motor defective
- Optics control board defective

SC128 - Scanning start speed abnormal

Definition: [level: C]

The scanner motor speed does not reach the standard value before the scanner reaches the original leading edge position.

Possible cause:

- Scanner motor defective
- Optics control board defective
- Scanner drive section defective

SC129 - Scanner motor speed abnormal

Definition: [level: C]

The scanner motor speed is out of the ±10% tolerance limit while scanning the original.

Possible cause:

- Scanner motor defective
- PSU (38V output) defective

7.1.4 LENS MAGNIFICATION

SC140 - Lens vertical home position sensor abnormal - stays off

Definition: [level: D]

When the lens returns to the home position, the lens vertical home position sensor does not detect the on condition within 2,100 pulses.

Possible causes:

- Lens vertical home position sensor shorted
- Lens vertical drive motor defective
- Optics control board defective

SC141 - Lens vertical home position sensor abnormal - stays on

Definition: [level: D]

When the lens leaves the home position, the lens vertical home position sensor does not detect the off condition within 1,200 pulses.

Possible causes:

- Lens vertical home position sensor open
- Lens vertical drive motor defective
- Optics control board defective

SC142 - Lens horizontal home position sensor abnormal - stays off

Definition: [level: D]

When the lens returns to the home position, the lens horizontal home position sensor does not detect the on condition within 1,400 pulses.

Possible causes:

- Lens horizontal home position sensor short
- Lens horizontal drive motor defective
- Optics control board defective

SC143 - Lens horizontal home position sensor abnormal - stays on

Definition: [level: D]

When the lens leaves the home position, the lens horizontal home position sensor does not detect the off condition within 1,000 pulses.

Possible causes:

- Lens horizontal home position sensor open
- Lens horizontal drive motor defective
- Optics control board defective

SC144 - 3rd scanner home position sensor abnormal - stays off

Definition: [level: D]

When the 3rd scanner returns to the home position, the 3rd scanner home position sensor does not detect the on condition within 1,400 pulses.

Possible causes:

- 3rd scanner home position sensor shorted
- 3rd scanner drive motor defective
- Optics control board defective

SC145 - 3rd scanner home position sensor abnormal - stays on

Definition: [level: D]

When the 3rd scanner leaves the home position, the 3rd scanner home position sensor does not detect the off condition within 700 pulses.

Possible causes:

- 3rd scanner home position sensor open
- 3rd scanner drive motor defective
- Optics control board defective

SC146 - Abnormal magnification operation

Definition: [level: D]

The lens vertical drive motor, the lens horizontal drive motor, or 3rd scanner motor moves for no apparent reason in the ready condition.

Possible causes:

- Lens vertical drive motor defective
- Lens horizontal drive motor defective
- 3rd scanner drive motor defective
- Optics control board defective

7.1.5 OPTICS THERMISTOR

SC190 - Optics thermistor open

Definition: [level: D]

The optics thermistor is open.

Possible causes:

- Optics thermistor open

SC193 - APS abnormal

Definition: [level B]

1) Abnormal rotation of the APS sensor motor is detected 4 times consecutively or 10 times totally after the main switch is turned on.
2) The value of APS correction is more than 500 or less than –500.

Possible cause:

- APS sensor defective

7.1.6 CHARGE CORONA UNIT

SC302 - Charge corona leakage

Definition: [level: D]

1) When charge corona leakage is detected.
2) Charge corona output is not detected for 200 ms.
3) Grid voltage is more than 1295 V or no output for 100 ms.

Possible causes:

- Main charge corona unit defective
- Main charge power pack defective
- High voltage control board defective

SC303 - Charge corona wire cleaner failure

Definition: [level: C]

The charge corona wire cleaner does not move back to the end block within 90 seconds.

Possible causes:

- Charge corona wire cleaner drive motor defective
- High voltage control board defective

7.1.7 DEVELOPMENT

SC341 - Development motor locked

Definition: [level: D]

The development motor lock signal stays low for more than 1 second in the development motor on condition.

Possible causes:

- Extra load in the development unit
- Development motor defective

SC345 - Toner collection motor locked

Definition: [level: D]

The toner collection motor lock signal stays low for more than 2.5 seconds in the toner collection motor on condition.

Possible cause:

- Toner collection motor defective
- Extra load of the toner collection mechanism

SC346 - Toner recycle motor disconnected

Definition: [level: D]

The toner recycle motor is disconnected for more than 1 second.

Possible cause:

- The toner recycle motor connector is disconnected.

7.1.8 PROCESS CONTROL SENSORS

SC351 - Abnormal V_{SG} detection (V_{SG} > 4.2V)

Definition: [level: C]

The detected V_{SG} value is not 4 ± 0.2 V.

Possible causes:

- ID sensor defective
- Main control board defective
- Drum defective

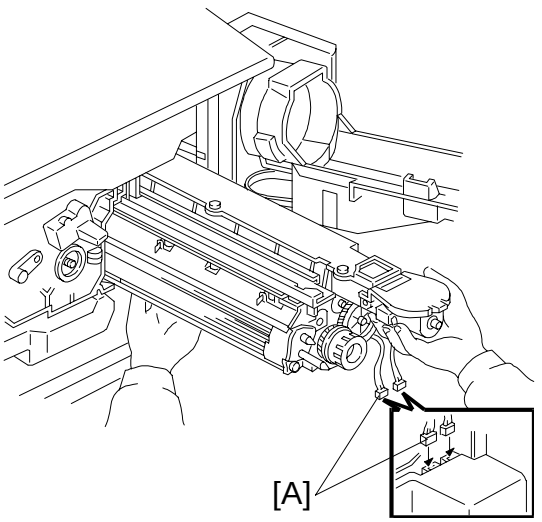
SC352 - Incomplete TD sensor initial setting

Definition: [level: C]

The output voltage of the TD sensor is higher than 2.1 V or lower than 1.75 V during the developer initial setting mode.
V_{OUT} to get 2.0 V for the TD sensor output is lower than 1.9 V.

Possible causes:

- Connector [A] not connected correctly
- Toner density sensor defective
- Abnormal toner concentration



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SC353 - Abnormal V_{SP} detection ($V_{SP} \geq 2.5$ V: lighter pattern)

Definition: [level: C]

V_{SP} is 2.5 V or higher.

Possible causes:

- ID sensor defective
- Drum
- High voltage control board defective
- Poor development bias terminal contact

SC354 - Abnormal V_{SG} detection ($V_{SG} \leq 2.5$ V)

Definition: [level: C]

1) V_{SG} is 2.5 V or less.
2) V_{SGP} is 2.5 V or less.

Possible causes:

- ID sensor defective
- Drum
- Dirty charge corona casing
- Quenching lamp defective
- Erase lamp defective
- Cleaning blade defective
- Dirty ID sensor

SC355 - Abnormal V_{TD} detection ($V_{TD} \geq 4.7$ V)

Definition: [level: C]

V_{TD} is 4.7 V or higher.

Possible causes:

- Toner density sensor defective
- Toner concentration too low

SC356 - Abnormal V_{TD} detection ($V_{TD} < 0.5$ V)

Definition: [level: C]

V_{TD} is less than 0.5 V.

Possible causes:

- Toner density sensor defective
- Toner concentration is too high

SC358 - Abnormal V_{SP} detection ($V_{SP}/V_{SG} < 2.5\%$)

Definition: [level: C]

V_{SP}/V_{SG} is less than 2.5%.

Possible causes:

- ID sensor defective
- Drum
- Toner scattering

SC361 - Incomplete drum potential sensor calibration

Definition: [level: C]

When the process control initial setting is performed and a development bias of –100 V or –800 V is applied to the drum shaft, the drum potential voltage is out of these ranges:
$0.1 \leq V_{-100} \leq 1.6$ [V] or $2.3 \leq V_{-800} \leq 5.0$ [V].

Possible causes:

- Drum potential sensor defective
- Drum shaft terminal not grounded
- Drum
- Charge corona unit defective
- Development power pack defective

SC364 - Abnormal V_D detection

Definition: [level: C]

V_D is out of specification (V_R + 770 ± 20 V).

Possible causes:

- Drum potential sensor defective
- Drum
- Charge corona unit defective

SC365 - Abnormal V_L detection

Definition: [level: C]

V_L is out of specification (V_R + 140 ± 20 V).

Possible causes:

- Drum potential sensor defective
- Drum
- Charge corona unit defective
- Optics too dirty

SC366 - Abnormal V_R

Definition: [level: C]

V_R is larger than 360 V during the process control initialization.

Possible causes

- Drum
- Drum shaft terminal not ground

7.1.9 TRANSFER CURRENT

SC402 - Transfer current leakage

Definition: [level: D]

1) The transfer power pack output voltage exceeds 360 μA for 80 ms or more.
2) No transfer current is detected.

Possible causes:

- Transfer belt defective
- Transfer power pack defective
- Poor contact at the transfer bias roller or discharge plate terminals

7.1.10 DRUM

SC440 - Abnormal main motor speed

Definition: [level: D]

The lock signal stays low for 1.0 second or more when the main motor is on.

Possible causes:

- Main motor defective

7.1.11 PAPER FEED

SC500 - Abnormal manual feed drive motor speed

Definition: [level: D]

The lock signal stays low for 1.0 second or more when the manual feed motor is on.

Possible causes:

- Manual feed motor defective

SC501 - Abnormal paper feed drive motor speed

Definition: [level: D]

The lock signal stays low for 1.0 second or more when the paper feed motor is on.

Possible causes:

- Paper feed motor defective
- Paper feed control board defective

SC502 - Abnormal 1st lift motor movement

Definition: [level: B]

1) The 1st lift sensor detects a high condition for 10 seconds or more after the 1st lift motor starts. The first time, after the paper tray is opened and closed, the 1st lift motor starts again.
2) The right tray down sensor does not turn on within 10 seconds after the 1st lift motor starts lowering the tray.
   If any of these conditions occur twice, this SC is displayed.

Possible causes:

- 1st lift sensor shorted
- 1st lift motor defective
- Paper feed control board defective
- Right tray down sensor defective

SC503 - Abnormal 2nd lift motor movement

Definition: [level: B]

The 2nd lift sensor detects a high condition for 10 seconds or more after the 2nd lift motor starts. The first time, after the paper tray is opened and closed, the 2nd lift motor starts again. If the above condition occurs twice, this SC is displayed.

Possible causes:

- 2nd lift sensor shorted
- 2nd lift motor defective
- Paper feed control board defective

SC504 - Abnormal 3rd lift motor movement

Definition: [level: B]

The 3rd lift sensor detects a high condition for 10 seconds or more after the 3rd lift motor starts. The first time, after the paper tray is opened and closed, the 3rd lift motor starts again. If the above condition occurs twice, this SC is displayed.

Possible causes:

- 3rd lift sensor shorted
- 3rd lift motor defective
- Paper feed control board defective

SC506 - Abnormal 3.5 k LCT motor movement

Definition: [level: B]

1) The LCT lift sensor detects a low condition for 30 seconds or more after the LCT motor starts.
2) The LCT tray down sensor does not turn on within 30 seconds after the LCT motor starts lowering the tray.
3) If the above condition occurs twice, this SC is displayed.

Possible causes:

- LCT motor defective
- LCT lift sensor shorted
- LCT tray down sensor defective

SC507 - Abnormal 3.5 k LCT feed motor movement

Definition: [level: B]

The LCT feed motor is locked for 1 second or more after this motor starts.

Possible causes:

- LCT feed motor defective

SC508 - Abnormal tandem rear fence drive motor movement

Definition: [level: B]

1) It takes 10 seconds or more for the rear fence return sensor to detect the on condition after the rear fence drive motor starts.
2) It takes 10 seconds or more for the rear fence home position sensor to detect the on condition after this fence starts moving to the home position.
3) When the tray is set, the rear fence return sensor and the rear fence home position sensor are both on.

Possible causes:

- Rear fence drive motor defective
- Rear fence HP sensor defective
- Rear fence return sensor defective

SC510 - Abnormal tandem side fence home position detection

Definition: [level: B]

1) Both the rear side fence open sensor and the rear side fence close sensor are on.
2) Both the front side fence open sensor and the front side fence close sensor are on.

Possible cause:

- Rear side fence open sensor defective
- Rear side fence close sensor defective
- Front side fence open sensor defective
- Front side fence close sensor defective

SC511 - Abnormal tandem side fence home position detection - stays on

Definition: [level: B]

When the side fence goes back to the home position or the side fence drive motor is closing the fence, the side fence positioning sensor stays on.

Possible causes:

- Side fence drive motor defective
- Side fence positioning sensor shorted

7.1.12 DUPLEX

SC520 - Abnormal fusing/duplex drive motor movement

Definition: [level: D]

The lock signal stays low for 1.0 second after the fusing/duplex drive motor starts.

Possible causes:

- Fusing/duplex drive motor defective
- The cleaning roller is too dirty and applies an excessive load to the fusing/duplex drive motor.

SC522 - Abnormal jogger home position sensor detection - stays off

Definition: [level: B]

When the jogger returns to the home position, the jogger home position sensor does not detect the on condition within 600 pulses.

Possible causes:

- Jogger motor defective
- Jogger HP sensor open

SC523 - Abnormal jogger home position sensor detection - stays on

Definition: [level: B]

The jogger home position sensor does not detect the off condition within 50 pulses after its sensor detects the on condition in the initializing mode.

Possible causes:

- Jogger drive motor defective
- Jogger HP sensor shorted

7.1.13 FUSING

SC541 – Fusing thermistor open

Definition: [level: A]

The A/D conversion value of the fusing themistor voltage stays over 252 (detected temperature is lower than 3°C) for 10 seconds.

Possible cause:

- Fusing thermistor open
- Optics control board defective

SC542 – Start key stays red

Definition: [level: A]

Before reaching the specified temperature for the ready condition, the fusing temperature does not increase 5°C or more within 30 seconds.

Possible cause:

- Fusing lamp defective
- AC drive board defective
- Fusing thermistor defective

SC543 - Fusing overheat (detected by the main control board)

Definition: [level: A]

A fusing temperature higher than 230°C is detected for 5 seconds.

Possible cause:

- Fusing thermistor defective
- Main control board defective

SC544 - Fusing overheat (detected by the optics control board)

Definition: [level: A]

A fusing temperature higher than 225°C is detected for 5 seconds.

Possible cause:

- AC drive board defective
- Optics control board defective
- Main control board defective
- Poor cable connection

SC546 - Low fusing temperature (detected by the optics control board)

Definition: [level: A]

The fusing temperature stays lower than 100°C for 5 seconds after the machine becomes ready.

Possible causes:

- Fusing thermistor defective
- AC drive board defective
- Fusing lamp open
- Main control board defective
- Optics control board defective

SC547 - Fusing lamp continuously lit

Definition: [level: A]

After the machine becomes ready, the fusing temperature does not increase 5°C or more even though the fusing lamp fully lights for more than 30 seconds.

Possible cause:

- Fusing lamp defective
- AC drive board defective
- Optics control board defective

SC548 - Unstable fusing temperature

Definition: [level: A]

If the fusing temperature changes by 20°C/second three times in 1 minute, this SC is displayed.

Possible causes:

- AC drive board defective
- Thermistor defective

7.1.14 SYSTEM CONTROL

SC600 - Communication error (main control board and operation panel)

Definition: [level: D]

The main control board does not communicate with the operation panel.

Possible causes:

- Main control board defective
- Operation panel defective
- Cable defective

SC601 - Communication error (main control board and optics control board)

Definition: [level: D]

The main control board does not communicate with the optics control board.

Possible causes:

- Main control board defective
- Optics control board defective
- Cable defective

SC620 - Communication error (main control board and DJF main board)

Definition: [level: C]

The main board does not communicate with the DJF main board.

Possible causes:

- Main control board defective
- DJF main board defective
- Cable defective
- Fiber optics defective

SC621 - Communication error (main control board and sorter staplers main board)

Definition: [level: D]

The main control board does not communicate with the sorter stapler main board.

Possible causes:

- Main control board defective
- Sorter stapler main board defective
- Cable defective
- Fiber optics defective

7.1.15 DUAL JOB FEEDER

SC700 - Abnormal DJF feed-in motor movement

SC701 - Abnormal DJF transport belt motor movement

SC702 - Abnormal DJF feed out motor movement

Definition: [level: C]

Encoder pulses are not detected by the DJF main board when the main motor is on. The first time, a jam occurs. The second time, the SC counter is increased.

Possible causes:

- DJF feed motor defective
- DJF transport motor defective
- DJF feed out motor defective
- DJF inverter motor defective

SC703 - Size detection encoder pulse defective

Definition: [level: C]

Pull-out roller in the registration section encoder pulses are not detected by the DJF main board. The first time, a jam occurs. The second time, the SC counter is incremented.

Possible cause:

- Encoder defective
- DJF main board defective

SC704 - Friction belt drive motor encoder pulse defective

Definition: [level: C]

Friction belt drive motor encoder pulses are not detected by the DJF main board. The first time, a jam occurs. The second time, the SC counter is incremented.

Possible cause:

- Encoder defective
- DJF main board defective

7.1.16 SORTER STAPLER

SC730 - Abnormal main motor sorter stapler movement (sorter staplers)

Definition: [level: D]

When the encoder pulse is not detected by the SS main board for 200 ms after the main motor starts, a jam is indicated. If this occurs twice, an SC is displayed.

Possible causes:

- SS main motor defective

SC731 - Abnormal bin drive (lift) motor movement (sorter staplers)

Definition: [level: B (A821), D (A658)]

1) If the wheel sensor (bin lift timing sensors) is not off 200 ms after the bin drive (lift) motor starts, jam “R2” is indicated.
2) If the wheel sensor (bin lift timing sensors) is not on 200 ms after it turned off, jam “R2” is indicated.

If any of these conditions occur twice, an SC occurs.

Possible causes:

- Wheel sensor (bin lift timing sensors) defective
- Bin drive (Lift) motor defective

SC735 - Abnormal jogger motor movement (sorter staplers)

Definition: [level: B (A821), D (A658)]

1) When the jogger moves back to the home position, the jogger home position sensor does not detect the on condition within 650 pulses. Then, a jam is indicated.
2) When the jogger moves from the home position forward, and moves back to the home position, the jogger home position sensor does not detect the off condition within 40 pulses or the sensor does not detect the on condition within 60 pulses when it moves back. Then, a jam is indicated.

If any of these conditions occur twice, an SC occurs.

Possible causes:

- Jogger motor defective
- Jogger home position sensor defective

SC737 - Abnormal gripper motor movement (sorter staplers)

Definition: [level: B (A821), D (A658)]

1) When the gripper moves to the staple position, the gripper home position sensor does not detect the on condition. Then a jam is indicated.
2) When the gripper moves from the staple position to the bin position, the gripper home position sensor does not detect the on condition within 1,045 pulses. Then a jam is indicated.
3) When the gripper moves to the home position, the gripper home position sensor does not detect the on condition within 1,250 pulses. Then a jam is indicated.
4) When the gripper moves from the home position forward, and moves back to the home position, the gripper home position sensor does not detect the off condition within 200 pulses or the sensor does not detect the on condition within 220 pulses when the gripper moves back. Then a jam is indicated.

If any of these conditions occur twice, an SC occurs.

Possible causes:

- Gripper motor defective
- Gripper home position sensor defective

SC738 - Abnormal staple motor movement (sorter staplers)

Definition: [level: B]

The staple home position sensor does not detect the off condition within 150 ms after the motor starts, or does not detect the on condition within 600 ms. Then a jam is indicated. If this occurs twice, this SC is displayed.

Possible causes:

- Staple unit (staple motor) defective
- A staple is jammed in the staple unit.

SC740 - Abnormal staple unit drive motor movement (sorter stapler)

Definition: [level: B]

1) When the staple unit has moved from the home position to the staple position, the stapler unit home position sensor is on. A jam is indicated.
2) The staple unit home position sensor does not detect the off condition (within 1640 pulses) when the staple unit moves to the home position. A jam is indicated.
3) The staple unit home position sensor does not detect the off condition (within 120 pulses) when the staple unit moves forward from the home position or does not detect the on condition within 160 pulses when it moves back to the home position. A jam is indicated.

If any of these conditions occur twice, an SC occurs.

Possible causes:

- Staple unit drive motor defective
- Staple unit home position sensor defective

SC741 - Abnormal bin rear plate motor movement (A821 sorter stapler only)

Definition: [level: B]

1) When the rear bin plate is open, the bin rear plate open sensor does not detect the on condition for 750 ms or more after the motor starts. Then a jam is indicated.
2) When the rear bin plate is closed, the bin rear plate home position sensor does not detect the on condition for 750 ms or more after the motor starts. Then a jam is indicated.
3) In the initial condition, the bin rear plate open sensor does not detect the on condition for 1.25 seconds or more after the motor starts. Then a jam is indicated.

If any of these conditions occur twice, an SC occurs.

Possible causes:

- Bin rear plate drive motor defective
- Bin rear plate open sensor defective
- Bin rear plate home position sensor defective

SC743 - Punch motor abnormal (sorter stapler with punch)

Definition: [level: B]

1) After turning on the main switch, the punch home position sensor is not activated within 1,100 pulses. Then an R2 jam is indicated.
2) In punch mode, the punch home position sensor is not activated within 950 pulses after starting the punch motor. Then an R2 jam is indicated.

If any of these conditions occur twice, an SC occurs.

Possible causes:

- Punch motor
- Punch home position sensor

SC744 - Staple jam release abnormal (A821 sorter stapler only)

Definition: [level B]

In the initial condition, the paper sensor is activated and the staple home position sensor is de-activated. Then, an R3 (staple) jam is indicated. If this condition occurs 4 times in a row, this SC is displayed.

Possible causes:

- Stapler

SC745 - Grip unit motor abnormal (A821 sorter stapler)

Definition: [level: B]

1) When the grip unit has moved to the staple position, the grip unit home position sensor is on. Then an R2 jam is indicated.
2) When the grip unit returns from the staple position to the home position, the grip unit home position sensor does not turn on within 1070 pulses. Then an R2 jam is indicated.
3) When the grip unit moves from the home position forward, and moves back to the home position, the grip unit home position sensor does not turn off within 350 pulses. Then an R2 jam is indicated.

If any of these conditions occur twice, an SC occurs.

Possible cause:

- Grip unit home position sensor defective
- Grip unit motor defective

7.1.17 OTHERS

SC900 - Total counter failure (staying in the on condition)

Definition: [level: D]

The mechanical total counter stays in the on condition.

Possible causes:

- Total counter defective
- Main control board defective

SC901 - Total counter failure (staying in the off condition)

Definition: [level: D]

The mechanical total counter stays in the off condition.

Possible causes:

- Total counter defective

SC902 - Electrical counter abnormal

Definition: [level: A]

The contents of the electrical counter are abnormal.

Possible cause:

- RAM board defective

SC - Full used toner bottle

Definition: [level: A]

The toner overflow switch is activated.

Possible causes:

- Toner collection bottle full
- Toner overflow switch defective

NOTE: Clear this SC as follows:

1) While the main switch is on, open the front door then take out the used toner collection bottle.
2) Remove the toner collection bottle then empty and clean the bottle.
3) Install the empty toner collection bottle.
4) Close the front door.

SC940 - Main switch abnormal

Definition: [level: A]

DC5V does not drop under 4.2 V within 3 seconds after the main switch is turned off.

Possible causes:

- Main switch defective
- Main control board defective

7.2 ELECTRICAL COMPONENT DEFECTS

7.2.1 SENSORS

NOTE: All photo-interrupters go low (GND) when the actuator interrupts the gap between the LED and the photo transistor.

Component	CN No.	Condition	Symptom
Scanner HP (S-1)	512-1	Open	SC121 is displayed.
		Shorted	SC120 is displayed.
3rd Scanner HP (S-2)	512-12	Open	SC145 is displayed.
		Shorted	SC144 is displayed.
Lens Vertical HP (S-3)	512-5	Open	SC141 is displayed.
		Shorted	SC140 is displayed.
Lens Horizontal HP (S-4)	511-3	Open	SC143 is displayed.
		Shorted	SC142 is displayed.
APS Sensor (S-5)	520-8	Open	SC193 is displayed.
		Shorted	
Auto Image Density (S-6)	507-1	Open	Image density will be abnormal.
		Shorted	
Drum Potential (S-7)	110-4	Open	The machine quits auto process control and enters detect supply mode.
		Shorted	
Toner Density (S-8)	114-3	Open	The machine quits auto toner supply mode and enters fixed supply mode.
		Shorted	
Image Density (S-9)	114-8	Open	The machine quits auto toner supply mode and enters detect mode.
		Shorted	
Toner Near End (S-10)	108-B14	Open	Toner is added even if there is too much toner in the toner hopper.
		Shorted	Toner is not supplied even if there is no toner in the toner hopper.
1st Paper Feed (S-11)	402-A1	Open	Whenever paper is fed, it is folded.
		Shorted	“Paper jam A” is displayed even if there is no paper.
2nd Paper feed (S-12)	402-A8	Open	Whenever paper is fed, it is folded.
		Shorted	“Paper jam A” is displayed even if there is no paper.
3rd Paper feed (S-13)	402-B8	Open	Whenever paper is fed, it is folded.
		Shorted	“Paper jam A” is displayed even if there is no paper.
1st Lift (S-14)	401-2	Open	“Add paper” is displayed even if there is paper on the paper tray.
		Shorted	The tray bottom plate locks at the upper position.
2nd Lift (S-15)	403-A2	Open	“Add paper” is displayed even if there is paper on the paper tray.
		Shorted	The tray bottom plate locks at the upper position.

Component	CN No.	Condition	Symptom
3rd Lift (S-16)	403-A10	Open	“Add paper” is displayed even if there is paper on the paper tray.
		Shorted	The tray bottom plate locks at the upper position.
1st Paper End (S-17)	401-5	Open	“Paper End” is not displayed even if there is no paper on the paper tray.
		Shorted	“Paper End” is displayed even if there is paper is the tray.
2nd Paper End (S-18)	403-A5	Open	“Paper End” is not displayed even if there is no paper on the paper tray.
		Shorted	“Paper End” is displayed even if there is paper is the tray.
3rd Paper End (S-19)	403-B5	Open	“Paper End” is not displayed even if there is no paper on the paper tray.
		Shorted	“Paper End” is displayed even if there is paper is tray.
By-pass Paper End (S-20)	108-A5	Open	“By-pass paper end” is not displayed even if there is no paper on the by-pass feed table.
		Shorted	“By-pass paper end” is displayed even if paper is set on the by-pass feed table.
1st paper Near End (S-21)	410-B6	Open	“Paper near end” is not displayed even if the tray is almost empty.
		Shorted	“Paper near end” is displayed even if there is enough paper on the paper tray.
2nd paper Near End (S-22)	412-A8	Open	“Paper near end” is not displayed even if the tray is almost empty.
		Shorted	“Paper near end” is displayed even if there is enough paper on the paper tray.
3rd paper Near End (S-23)	412-A11	Open	“Paper near end” is not displayed even if the tray is almost empty.
		Shorted	“Paper near end” is displayed even if there is enough paper on the paper tray.
Right Tray Down (S-24)	410-B3	Open	The bottom plate lift lever locks at the lowest position.
		Shorted	The bottom plate is not lowered when paper on the left tray shift to the right tray, and paper is set in the improper position.
Right Tray Paper (S-25)	410-B9	Open	The bottom plate rises and falls even if there is no paper.
		Shorted	The bottom plate does not rise even if there is paper on the tray.
Front Side Fence Open (S-26)	410-A3	Open	SC510 is displayed.
		Shorted	SC511 is displayed.

Component	CN No.	Condition	Symptom
Front Side Fence Close (S-27)	410-A6	Open	SC510 is displayed.
		Shorted	SC511 is displayed.
Rear Side Fence Open (S-28)	410-A9	Open	SC510 is displayed.
		Shorted	SC511 is displayed.
Rear Side Fence Close (S-29)	410-A12	Open	SC510 is displayed.
		Shorted	SC511 is displayed.
Rear Fence HP (S-30)	414-6	Open	SC508 is displayed.
		Shorted	When the rear fence returns to the home position, SC508 is displayed.
Rear Fence Return (S-31)	414-10	Open	When the rear fence reaches the return position, the rear plate locks there then SC508 is displayed.
		Shorted	SC508 is displayed.
Left Tandem Paper End (S-32)	414-13	Open	The rear fence moves back and forth continuously.
		Shorted	The paper on the left tray is not moved to the right tray.
Paper Guide (S-33)	109-B4	Open	—
		Shorted	Whenever a duplex copy is made, “Paper Jam T” occurs.
Duplex Entrance (S-34)	112-A13	Open	“Paper Jam T” is displayed even if there is no paper.
		Shorted	Whenever a duplex copy is made, “Paper Jam T” occurs.
Duplex Transport (S-35)	112-A8	Open	“Paper Jam T” is displayed even if there is no paper.
		Shorted	Whenever a duplex copy is made, “Paper Jam T” occurs.
Duplex Exit (S-36)	112-A2	Open	“Paper Jam T” is displayed even if there is no paper.
		Shorted	Whenever a duplex copy is made, “Paper Jam T” occurs.
Duplex Paper End (S-37)	112-A9	Open	“There are copies in duplex tray” is displayed even if there is no paper in the duplex tray.
		Shorted	Only one rear side copy is made regardless of the quantity of copies.
Jogger HP (S-38)	112-A10	Open	Jogger motor locks (SC522 counts up)
		Shorted	Jogger motor locks (SC523 counts up)
Vertical Transport (S-39)	108-A2	Open	—
		Shorted	—
Guide Plate Position (S-40)	108-B9	Open	“Guide Plate Open” is not displayed even if the guide plate is open.
		Shorted	“Guide Plate Open” is displayed even if the guide plate is closed.

Component	CN No.	Condition	Symptom
Registration (S-41)	108-A7	Open	“Paper Jam C” is displayed even if there is no paper.
		Shorted	Whenever a copy is made, “Paper Jam C” occurs.
Fusing Unit (S-42)	109-B7	Open	“Paper Jam D” is displayed even if there is no paper.
		Shorted	Whenever a copy is made, “Paper Jam C and D” occurs.
Exit (S-43)	109-A2	Open	“Paper Jam E” is displayed even if there is no paper.
		Shorted	Whenever a copy is made, “Paper Jam D” occurs.
Auto-Response (S-44)	101-7	Open	The machine does not exit “Screen Saver” mode even if an operator approaches the machine.
		Shorted	“Screen Saver” mode does not work.
Toner Overflow (S-45)	412-B3	Open	The Full Used Toner Bottle indicator does not light even if the toner collection bottle becomes full.
		Shorted	The Full Used Toner Bottle indicator lights even if the toner collection bottle is not full.
Original Length sensor (S-46)	507-5	Open	LT size is misdetected as LG size.
		Shorted	LG size is misdetected as LT size.
Platen Cover Position-1 (S-47)	512-7	Open	APS and AMS do not function correctly.
		Shorted	
Platen Cover Position-2 (S-48)	511-3	Open	“Original is on platen glass” is displayed even if the original on the glass has already been removed.
		Shorted	The ADF cannot be used.

7.2.2 SWITCHES

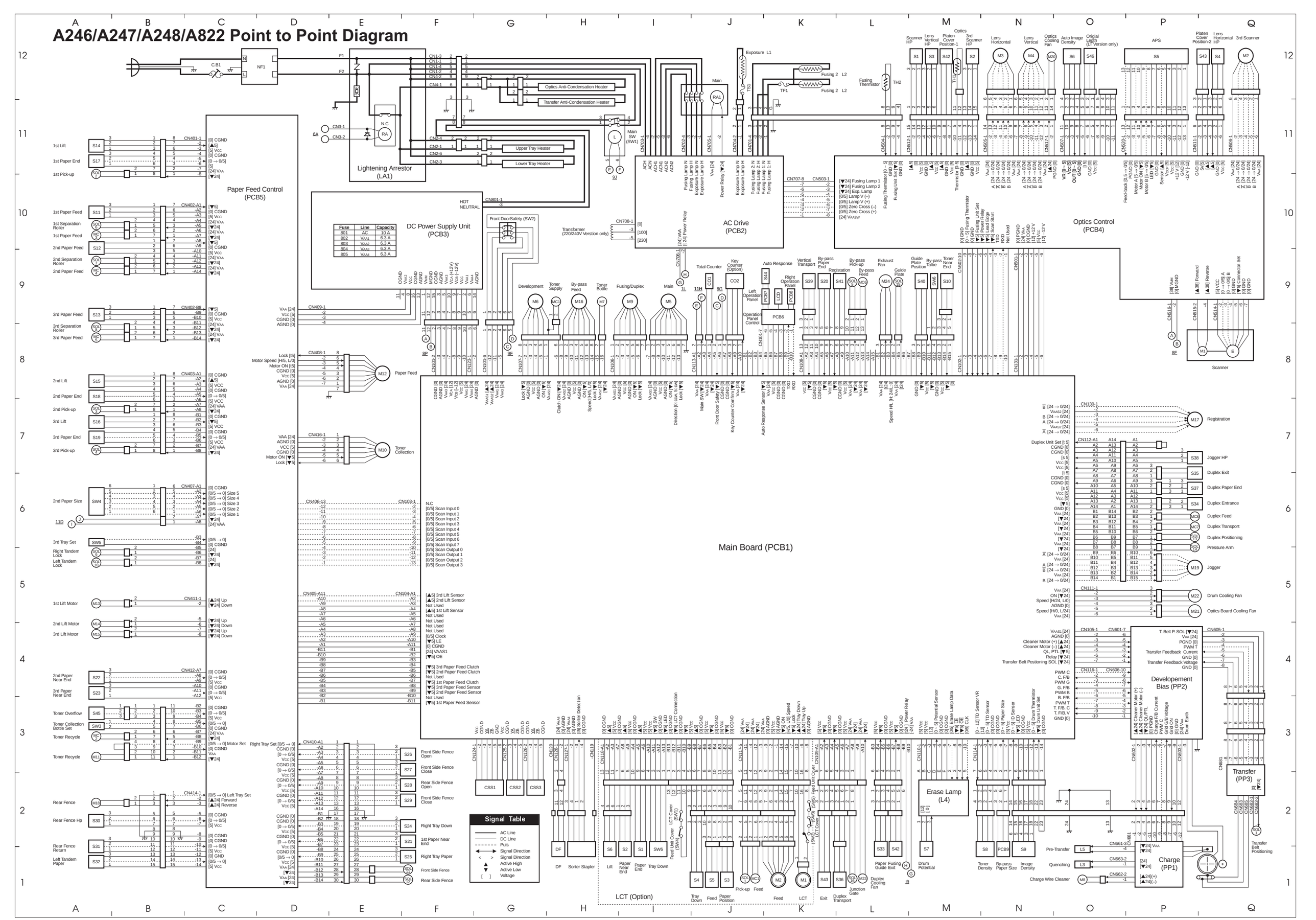
Component	CN No.	Condition	Sympton
Main (SW-1)	—	Open	The copier does not turn on.
		Shorted	The copier does not turn off.
Front Door Safety (SW-2)	—	Open	“Doors/Covers Open” is displayed even if the front door is closed.
		Shorted	Copier does not turn off when the front doors are open.
Toner Collection Bottle (SW-3)	412-B7	Open	No caution is displayed on the LCD even if the toner collection bottle is set incorrectly.
		Shorted	“Set used toner bottle correctly” is displayed.
2nd Paper Size (SW-4)	407-A2 ~ A6	Open	The CPU cannot detect proper paper size, and misfeeds may occur when a copy is made.
		Shorted	
3rd Tray Set (SW-5)	407-B3	Open	When the 3rd tray is selected, SC504 is displayed.
		Shorted	The 3rd tray cannot be selected even if the 3rd tray is set in the machine.
By-pass Table (SW-6)	108-B11	Open	“Open the by-pass tray” is displayed even if the by-pass tray is opened.
		Shorted	—

7.2.3 FUSES

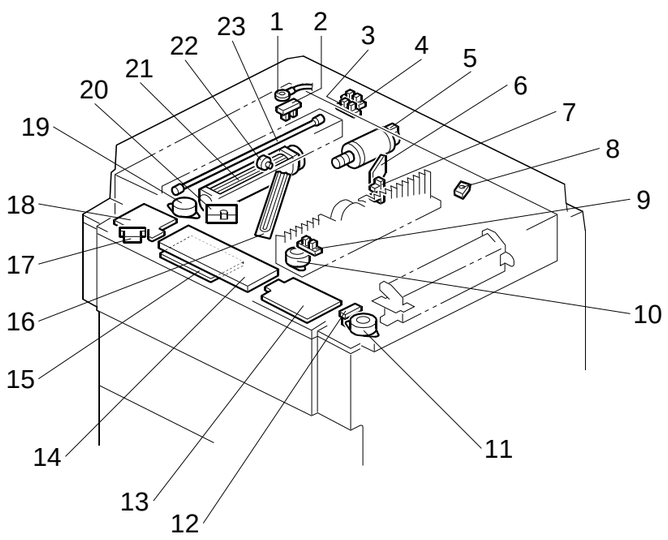
DC Power Supply Board

Component	Condition	Symptom
FU801	Open	Power is not provided when the main switch is on (Nothing is displayed on the operation panel).
FU802	Open	Power is not provided when the main switch is on (Nothing is displayed on the operation panel).
FU803	Open	Paper jam “A” occurs after the Start key is pressed.
FU804	Open	SC105 is displayed after the main switch is turned on.
FU805	Open	The ADF and sorter do not work.

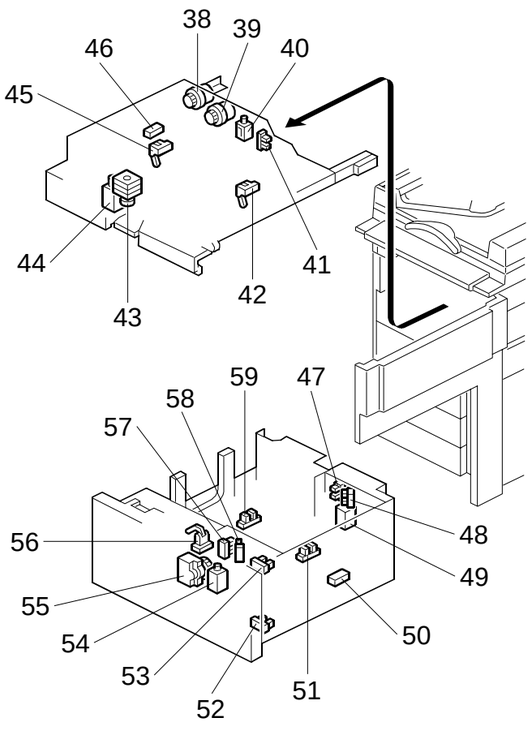
A246/A247/A248/A822 Point to Point Diagram



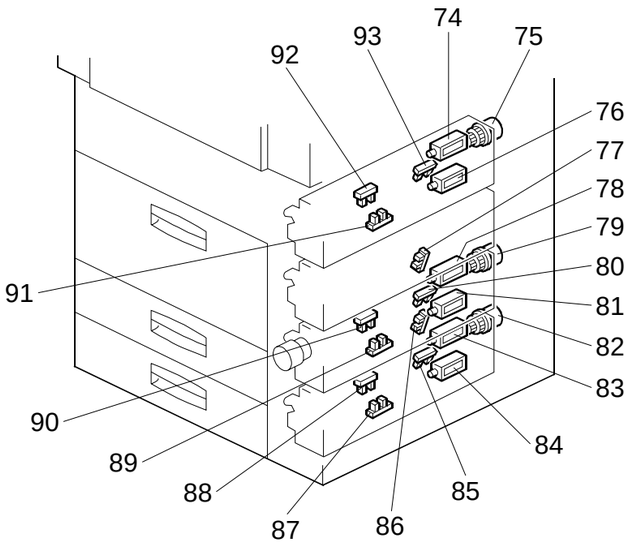
ELECTRICAL COMPONENT LAYOUT (A246/A247/A248/A822) 1/2



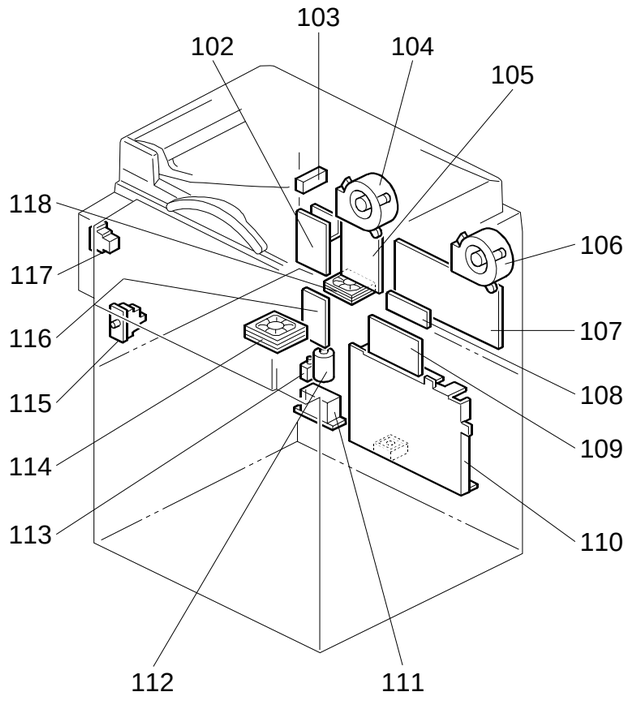
A246S500.WMF



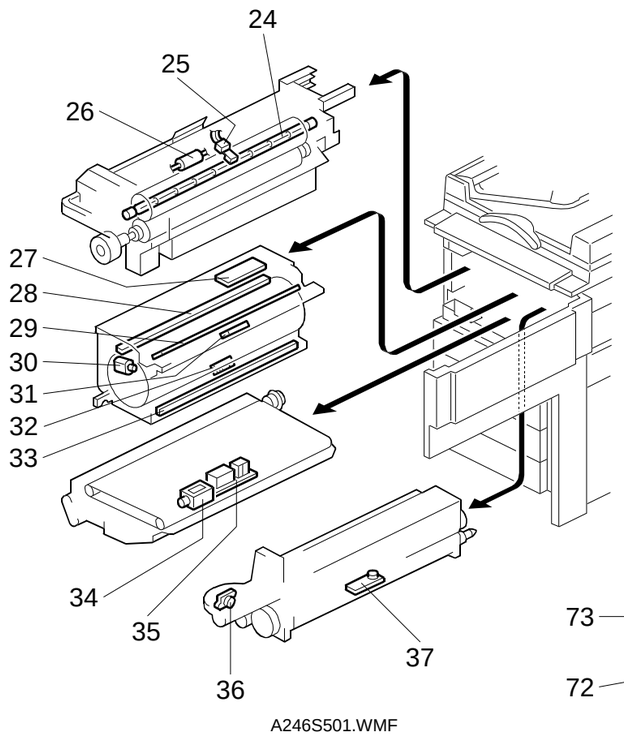
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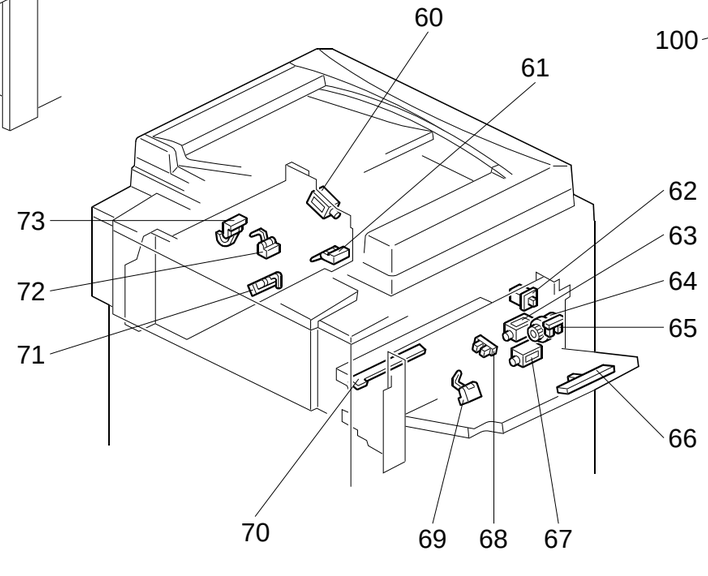
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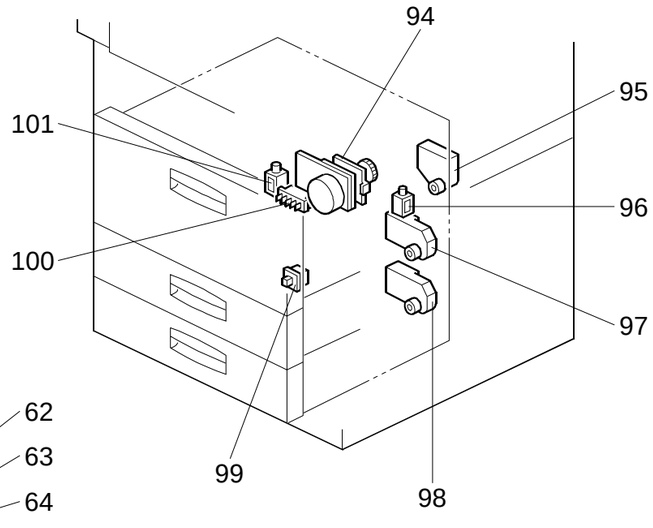
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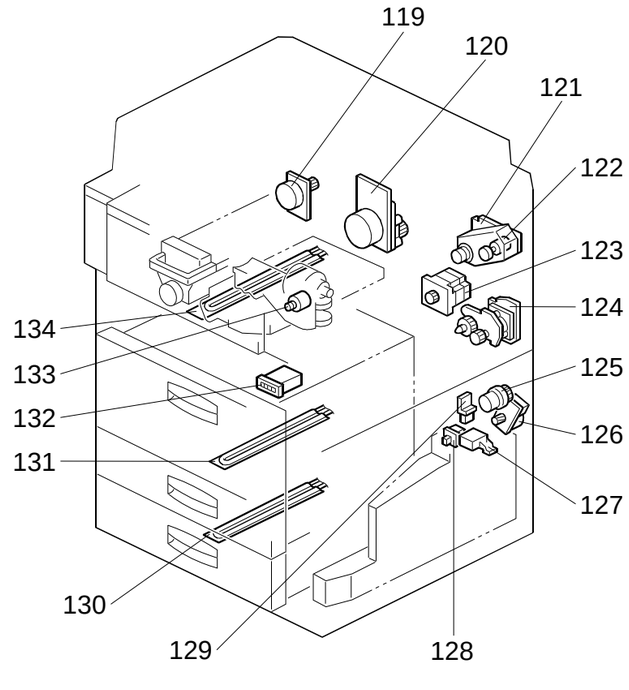
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A246S503.WMF



A246S505.WMF



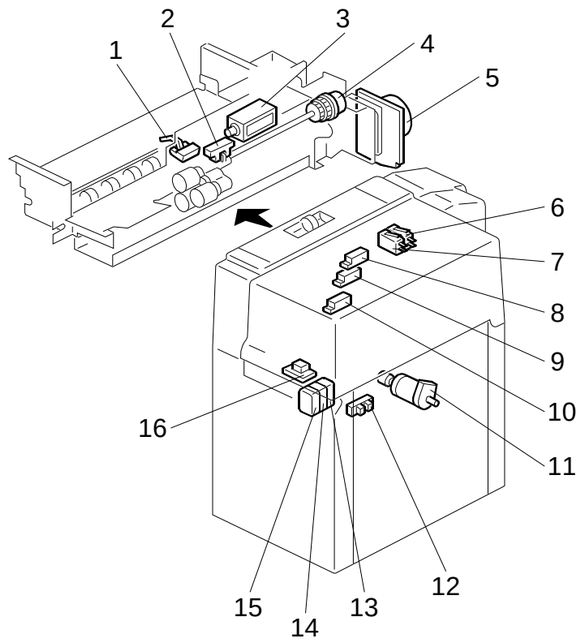
A246S507.WMF

ELECTRICAL COMPONENT LAYOUT (A246/A247/A248/A822) 2/2

Symbol	Name	Index No.	P to P
Motors			
M1	Scanner	5	Q8
M2	3rd Scanner	11	Q12
M3	Lens Horizontal	10	N12
M4	Lens Vertical	19	N12
M5	Main	120	I9
M6	Development	121	G9
M7	Toner Bottle	133	H9
M8	Charge Wire Cleaner	30	O1
M9	Fusing/Duplex	119	19
M10	Toner Collection	126	E7
M11	Toner Recycle	129	A3
M12	Paper Feed	94	E8
M13	1st Lift	95	A5
M14	2nd Lift	97	A4
M15	3rd Lift	98	A4
M16	By-pass Feed	124	H9
M17	Registration	123	Q7
M18	Rear Fence	55	A2
M19	Jogger	43	Q5
M20	Optics Cooling Fan	21	O12
M21	Optics Board Cooling Fan	118	Q5
M22	Drum Cooling Fan	106	Q5
M23	Duplex Cooling Fan	114	L1
M24	Exhaust Fan	104	L9
Magnetic Clutches			
MC1	Toner Supply	122	H9
MC2	Toner Recycling	125	A3
MC3	1st Feed	75	A10
MC4	2nd Feed	79	A9
MC5	3rd Feed	82	A8
MC6	By-pass Feed	64	L99
MC7	Duplex Transport	39	Q6
MC8	Duplex Feed	38	Q6
Switches			
SW1	Main	117	H11
SW2	Front Door Safety	115	G10
SW3	Toner Collection Bottle	128	A3
SW4	2nd Paper Size	100	A6
SW5	3rd Tray Set	99	A6
SW6	By-pass Table	62	M9
Solenoids			
SOL1	Transfer Belt Positioning	34	Q2
SOL2	1st Pick-up	74	A11
SOL3	2nd Pick-up	78	A7
SOL4	3rd Pick-up	83	A7
SOL5	By-pass Pick-up	63	L9
SOL6	1st Separation Roller	76	A10
SOL7	2nd Separation Roller	81	A9
SOL8	3rd Separation Roller	84	A8
SOL9	Right Tandem Lock	96	A5
SOL10	Left Tandem Lock	101	A5
SOL11	Front Side Fence	54	E1
SOL12	Rear Side Fence	49	E1
SOL13	Duplex Positioning	40	Q6
SOL14	Pressure Arm	44	Q5
SOL15	Guide Plate	67	L9
SOL13	Junction Gate	60	L1

Symbol	Name	Index No.	P to P
Sensors			
S1	Scanner HP	2	M12
S2	3 rd Scanner HP	9	M12
S3	Lens Vertical HP	7	M12
S4	Lens Horizontal HP	12	Q12
S5	APS	20	P12
S6	Auto Image Density	6	O12
S7	Drum Potential	31	M1
S8	Toner Density	37	N1
S9	Image Density	32	N1
S10	Toner Near End	36	M9
S11	1st Paper Feed	91	A10
S12	2nd Paper Feed	89	A10
S13	3rd Paper Feed	87	A9
S14	1st Lift	93	A11
S15	2nd Lift	80	A8
S16	3rd Lift	85	A7
S17	1st Paper End	92	A11
S18	2nd Paper End	90	A8
S19	3rd Paper End	88	A7
S20	By-pass Paper End	65	K9
S21	1st Paper Near End	53	E2
S22	2nd Paper Near End	77	A4
S23	3rd Paper Near End	86	A4
S24	Right Tray Down	52	E2
S25	Right Tray Paper	50	E1
S26	Front Side Fence Open	58	E3
S27	Front Side Fence Close	57	E3
S28	Rear Side Fence Open	48	E2
S29	Rear Side Fence Close	47	E2
S30	Rear Fence HP	59	A2
S31	Rear Fence Return	51	A1
S32	Left Tandem Paper	56	A1
S33	Paper Guide	61	L1
S34	Duplex Entrance	45	Q6
S35	Duplex Exit	42	Q7
S36	Duplex Transport	71	L1
S37	Duplex Paper End	46	Q6
S38	Jogger HP	41	Q7
S39	Vertical Transport	69	K9
S40	Guide Plate Position	68	M9
S41	Registration	70	L9
S42	Fusing Exit	72	L1
S43	Exit	73	K1
S44	Auto Response	17	J9
S45	Toner Overflow	127	A3
S46	Original Length (LT version only)	8	O12
S47	Platen Cover Position 1 (Option)	3	M12
S48	Platen Cover Position 2 (Option)	4	Q12

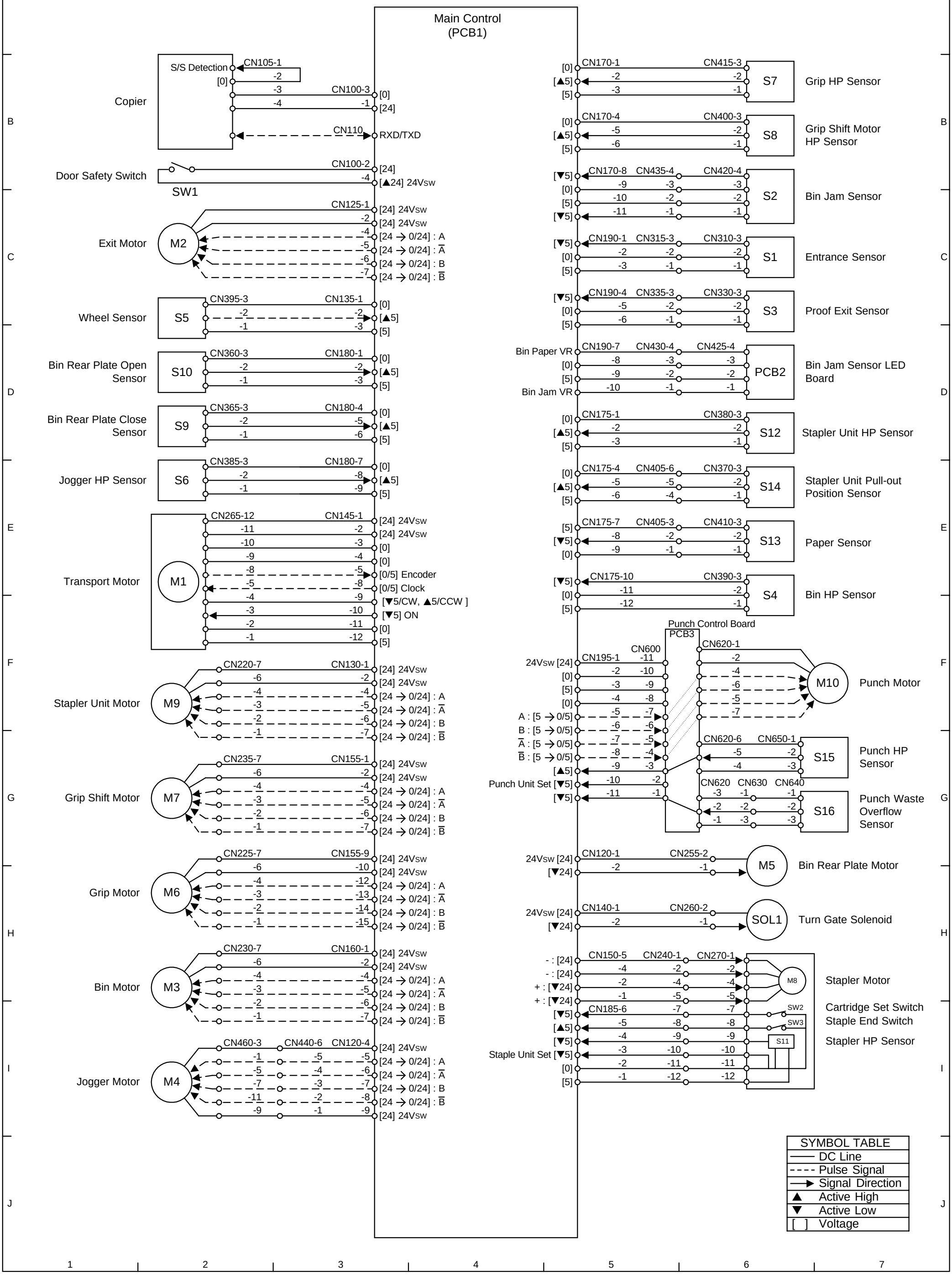
Symbol	Name	Index No.	P to P
PCBs			
PCB1	Main	107	J6
PCB2	AC Drive	102	J10
PCB3	DC Power Supply	110	F10
PCB4	Optic Control	105	O10
PCB5	Paper Feed Control	109	C10
PCB6	Operation Panel Control	15	K9
PCB7	Left Operation Panel	18	J9
PCB8	Right Operation Panel	13	K9
PCB9	By-pass Paper Size	66	N1
Lamps			
L1	Exposure Lamp	23	J12
L2	Fusing Lamps	24	K12
L3	Quenching	28	O1
L4	Erase	29	M2
L5	Pre-transfer	33	O1
Power Packs			
PP1	Charge	27	P1
PP2	Development	108	P4
PP3	Transfer	35	Q2
Heaters			
H1	Optic Anti-condensation	16	H12
H2	Transfer Anti-condensation	134	H12
H3	Upper Tray	131	G11
H4	Lower Tray	130	G11
Thermistors			
TH1	Optic	1	M12
TH2	Fusing	25	L12
TH3	Drum (on the image density Sensor)	(32)	N1
Others			
CB1	Circuit Breaker	113	C12
CO1	Total Counter	132	J9
CO2	Key Counter	-	J9
LA1	Lightening Arrestor	116	E11
LCD1	LCD	14	K9
NF1	Noise Filter	112	D12
RA1	Main Power Relay	103	J12
TF1	Fusing Thermofuse	26	K12
TR1	Transformer (220 V version only)	111	H10
TS1	Optics Thermoswitch	22	J2



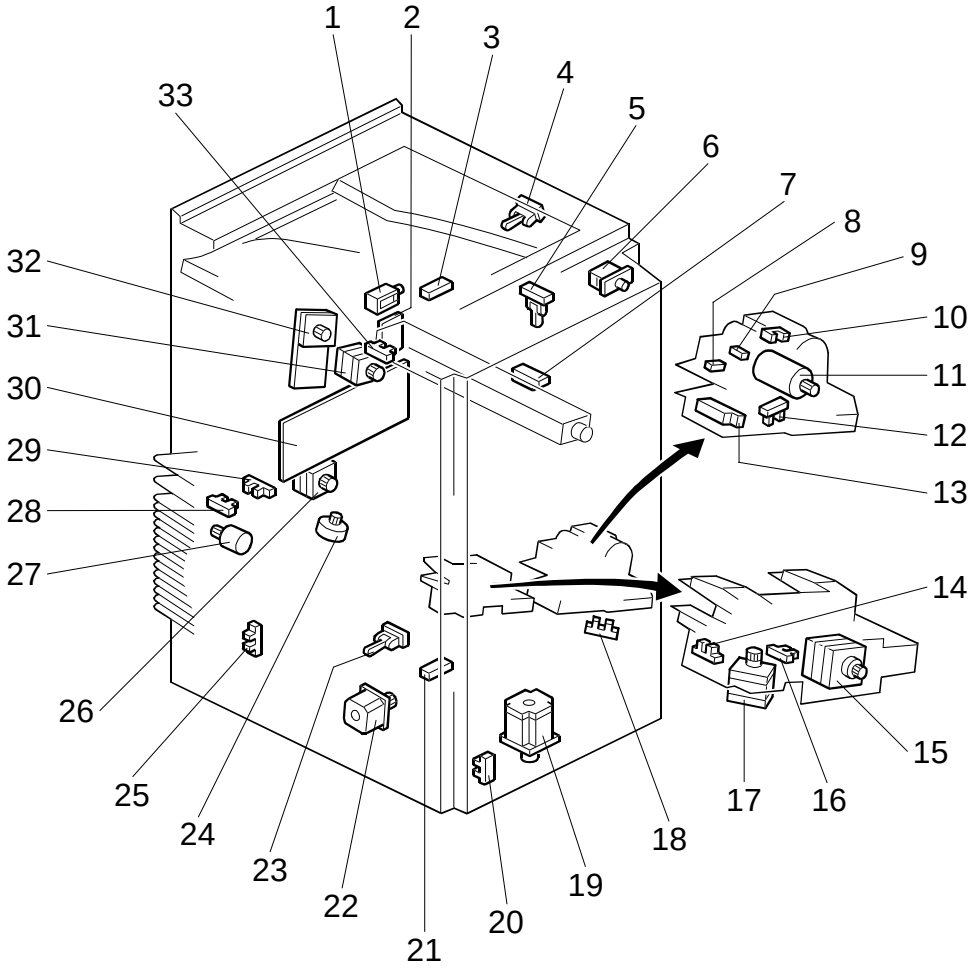
A822S500.WMF

Symbol	Name	Index No.	P to P
Motors			
M1	LCT	11	K1
M2	Feed	5	K1
Magnetic Clutch			
MC1	Feed	4	K1
Switches			
SW1	LCT Cover 1	15	I2
SW2	LCT Cover 2	14	K2
SW3	LCT Cover 3	13	K2
SW4	Feed Unit Cover 1	6	I1
SW5	Feed Unit Cover 2	7	K2
SW6	Tray Down	16	I1
Sensors			
S1	Paper End	8	I1
S2	Paper Near End	9	I1
S3	Paper Position	10	J1
S4	Tray Down	12	J1
S5	Feed	1	J1
S6	Lift	2	H1
Solenoids			
SOL1	Pick-up	3	J1

POINT TO POINT DIAGRAM (SORTER STAPLER: A821)



ELECTRICAL COMPONENT LAYOUT (A821)



A821S500.WMF

Symbol	Name	Index No.	P to P
Motors			
M1	Transport	32	E2
M2	Exit	26	C2
M3	Bin	19	H2
M4	Jogger	22	I2
M5	Bin Rear Plate	27	G6
M6	Grip	15	H2
M7	Grip Shift	17	G2
M8	Stapler	11	H6
M9	Stapler Unit	24	F2
M10	Punch	31	F7
Switches			
SW1	Door Safety	6	B2
SW2	Cartridge Set	8	I6
SW3	Staple End	9	I6
Solenoids			
SOL1	Turn Gate	1	H6
Sensors			
S1	Entrance	5	C6
S2	Bin Jam	21	C6
S3	Proof Exit	4	C6
S4	Bin HP	23	E6
S5	Wheel Sensor	20	C2
S6	Jogger HP	25	E2
S7	Grip HP	16	B6
S8	Grip Shift Motor HP	14	B6
S9	Bin Rear Plate Close	28	D2
S10	Bin Rear Plate Open	29	D2
S11	Stapler HP	10	I6
S12	Stapler Unit HP	18	D6
S13	Paper	13	E6
S14	Stapler Unit Pull-out Position	12	E6
S15	Punch HP	33	G7
S16	Punch waste Overflow	7	G7
PCBs			
PCB1	Main	30	A4
PCB2	Bin Jam Sensor LED	3	D6
PCB3	Punch Control	2	F6